

<211> 167
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1388

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Met Val Ala Phe Gly Val Asp Gln Gly Leu Leu Leu Leu Gln Gln Gly
  1           5           10           15

Gly Leu Gly Gly Gly Leu Lys Leu Arg Gln Leu Gly Leu Gln Gly Leu
      20           25           30

Tyr Ala Gly Val Leu Leu Pro Ala Leu Phe Leu Asn Leu Arg Glu Phe
      35           40           45

Phe Leu His Gly Asp Val Phe Phe Val Gln Arg Val Tyr Gly Phe Gly
      50           55           60

Gln Leu Val Glu Leu Asp Val Leu Leu Val Val Leu Glu Leu Gly Phe
      65           70           75           80

Ile Gly Glu Gly Lys Leu Leu Pro Ala Phe Leu Pro Val Gln Gly Leu
      85           90           95

Leu Phe Glu Pro Gly Asp Leu Leu Pro Val Val Leu Phe Leu Arg Val
      100          105          110

Glu Phe Val Asp Gly Asp Phe Gly Lys Pro Val Leu Ala Val Gly Phe
      115          120          125

Gln Gln Gly Lys Leu Arg Leu Phe Gln Thr Ala Leu Leu Leu Leu Ala
      130          135          140

Ala Val Arg Gly Gly Leu Leu Leu Val Phe Glu Phe Gly Gly Gly Phe
      145          150          155          160

Leu Gln Ser Ser Asp Val Val
      165
  
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<210> 1389
 <211> 504
 <212> DNA
 <213> Neisseria meningitidis

<400> 1389

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ctgttcctga atctgcgcga gtttctcttg cacaacaata tattcttcgt ccaaggctcg 180
tacggcttcg cttaattctt caagcttgat gtgctgctcg tcgttttgga actcggtttc 240
ataggcgagg gcaagctctt gctggcgcttc ctgccagtcg agggtttgct gttcaagctg 300
ggcgatttgc tgccggtagt tttgtttttg ctggttgagt ttgtggacgg cgacttcggc 360
aagcccgtat tggcggttg cttccaacag ggcaagctgc gcctgtttca gacggccttg 420
ctgctcttgg cggctgtgcg cgggtggttg ctgctgggtg tcgagttcgg cggcggtctc 480
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<210> 1390

<211> 167
 <212> PRT
 <213> Neisseria meningitidis

<400> 1390
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 20 25 30
 His Phe Ser Val Leu Leu Pro Ala Leu Phe Leu Asn Leu Arg Glu Phe
 35 40 45
 Leu Leu His Asn Asn Ile Phe Phe Val Gln Gly Leu Tyr Gly Phe Ala
 50 55 60
 Xaa Phe Phe Lys Leu Asp Val Leu Leu Val Val Leu Glu Leu Gly Phe
 65 70 75 80
 Ile Gly Glu Gly Lys Leu Leu Leu Ala Phe Leu Pro Val Glu Gly Leu
 85 90 95
 Leu Phe Lys Leu Gly Asp Leu Leu Pro Val Val Leu Phe Leu Leu Val
 100 105 110
 Glu Phe Val Asp Gly Asp Phe Gly Lys Pro Val Leu Ala Val Gly Phe
 115 120 125
 Gln Gln Gly Lys Leu Arg Leu Phe Gln Thr Ala Leu Leu Leu Leu Ala
 130 135 140
 Ala Val Arg Gly Gly Leu Leu Leu Val Phe Glu Phe Gly Gly Gly Phe
 145 150 155 160
 Leu Gln Gly Asn Asp Val Val
 165

<210> 1391
 <211> 504
 <212> DNA
 <213> Neisseria meningitidis

<400> 1391
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 ctgctcctga atctgcgcga gtttctcctg tacgacaata tattcttcgt ccaaactctg 180
 tacggcttcg ctcaactctt cgagcttgat gtgctgctcg tcgttttgga actcggtttc 240
 ataggcgagg gcaagctctt gctggcgctt ctgccaatcg aaggtttggt gttcaagctg 300
 ggcaatttgc tgttggtagt tttgtttttg ctggttgagc ttgtggacgg cgacttcggc 360
 aagcccgat tggcggttgg cttccaacag ggcaagctgc gctgtttca gacgaccttg 420
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 ctgcaaaatg gcgatgtcgt ctga 504

<210> 1392

<211> 167
 <212> PRT
 <213> Neisseria meningitidis

<400> 1392

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Met Val Ala Phe Gly Val Asp Gln Gly Phe Leu Leu Leu Gln Gln Gly
 1          5          10          15

Gly Leu Gly Gly Gly Leu Lys Leu Arg Gln Leu Gly Leu Gln Gly Leu
 20          25          30

Tyr Ala Gly Val Leu Phe Pro Thr Leu Leu Leu Asn Leu Arg Glu Phe
 35          40          45

Leu Leu Tyr Asp Asn Ile Phe Phe Val Gln Thr Leu Tyr Gly Phe Ala
 50          55          60

Gln Leu Phe Glu Leu Asp Val Leu Leu Val Val Leu Glu Leu Gly Phe
 65          70          75          80

Ile Gly Glu Gly Lys Leu Leu Leu Ala Phe Leu Pro Ile Glu Gly Leu
 85          90          95

Leu Phe Lys Leu Gly Asn Leu Leu Leu Val Val Leu Phe Leu Leu Val
100          105          110

Glu Leu Val Asp Gly Asp Phe Gly Lys Pro Val Leu Ala Val Gly Phe
115          120          125

Gln Gln Gly Lys Leu Arg Leu Phe Gln Thr Thr Leu Leu Leu Leu Ala
130          135          140

Ala Val Arg Gly Gly Leu Leu Leu Val Phe Glu Phe Gly Gly Gly Phe
145          150          155          160

Leu Gln Asn Gly Asp Val Val
165
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<210> 1393
 <211> 1725
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1393

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gaaaagctcg gcaaccacat cggcgtgttt gcctgcgtgt tggcgcaggt cgagcggcat 180
catgtggaag ccgaacacgg acacggaacg gatgaggtct gccaaacggc cttcggcaag 240
caggcggctg ccgttgctga taagggaacg ttgcaatttt ttcaaatacat cgagaaattt 300
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aaacggattg ccgtcgcggg cgccgccgat ccagccgccg attttaagga tattcggaac 660
cgggacatcg ggataggccg tctgaaagtc gtgttccatc ttgcggtaga gtttgggcag 720
```

```

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tacaatcgcc cgcaactggt tttttccgaa catcatcatg accgcgaccg aacacgacaa 1560
cgacgacgca ctctgtctgc ggtacagccg ccacatectc ttggacgaaa tcggcatcga 1620
agggcagcag aagctttccg ccgcgcatat tttggctcgt ggctgcggcg gattgggcgc 1680
cgccgcccct gccctatctc gccgcctcgg gggtcggcac gctga 1725

```

<210> 1394

<211> 574

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1394

```

Met Val Ala Val Cys Asp Glu Arg Ala Val Gln Arg Thr Leu Val Ala
  1             5             10             15

```

```

Gln Phe Ala Gln Gln Gly Gly Leu Phe Leu Leu Phe Val Gln Ala Val
          20             25             30

```

```

Val Val Phe Gln Ala Cys Val Leu Glu Lys Leu Gly Asn His Ile Gly
          35             40             45

```

```

Val Phe Ala Cys Val Leu Ala Gln Val Glu Arg His His Val Glu Ala
          50             55             60

```

```

Glu His Gly His Gly Thr Asp Glu Val Cys Gln Thr Ala Phe Gly Lys
          65             70             75             80

```

```

Gln Ala Ala Ala Val Val Asp Lys Gly Thr Leu Gln Phe Phe Gln Ile
          85             90             95

```

```

Ile Glu Lys Phe Leu Gly Arg Ser Ile Arg Leu Glu Lys Ala Glu Phe
          100            105            110

```

```

Ala Ala His Ala Gln Thr Glu Arg Ala Arg Phe Ala His Ser Ala Arg
          115            120            125

```

```

His Asn Val Gly Asn Gly Ala Ala Val Arg Phe Phe Gly Ala Gly Asp
          130            135            140

```

```

Phe Phe Val Arg Arg Glu Gly Cys Gln Cys His Tyr Val Val Val Asp
          145            150            155            160

```

```

Phe Asp Ala Ala Asp Gly Lys Arg Gln Phe Ala Val Lys Phe Val Glu
          165            170            175

```

| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | Ala | Ala | Val | Lys | Thr | Glu | His | Gly | Ile | Gly | Val | Ala | Ala | Glu | Gly | 180 | 185 | 190 |
| Lys | Ala | Gln | Gly | Phe | Ala | Arg | Asn | Lys | Arg | Ile | Ala | Val | Ala | Val | Ala | 195 | 200 | 205 |
| Ala | Asp | Pro | Ala | Ala | Asp | Phe | Lys | Asp | Ile | Arg | Asn | Ala | Asp | Ile | Gly | 210 | 215 | 220 |
| Ile | Gly | Arg | Leu | Lys | Val | Val | Phe | His | Leu | Ala | Val | Glu | Phe | Gly | Gln | 225 | 230 | 235 |
| Gly | Phe | Lys | Lys | Ala | His | Arg | Glu | Asp | Gly | His | Ala | Val | Val | Asp | Phe | 245 | 250 | 255 |
| Val | Val | Asp | Ala | Glu | Phe | Val | Ala | Ala | Arg | Phe | Ala | Gly | Leu | Pro | Gln | 260 | 265 | 270 |
| Ala | Gln | Lys | His | Gly | Val | Asp | Phe | Ala | Ala | Gln | Pro | Cys | Gln | Arg | Val | 275 | 280 | 285 |
| Gly | Ile | Gly | Ala | Ala | Phe | Ala | Leu | Arg | Gln | Gln | Arg | Ala | Asp | Ala | Ala | 290 | 295 | 300 |
| Val | Glu | Ile | Gln | Asn | Gly | Leu | Ala | Leu | His | Phe | Gly | Arg | Val | Arg | Gly | 305 | 310 | 315 |
| Gln | Asn | Gly | Gly | Asn | Gly | Arg | Ile | Val | Gln | Leu | Pro | Leu | His | Arg | Phe | 325 | 330 | 335 |
| Ala | Val | Gly | Phe | Pro | Arg | Phe | Glu | Pro | Ala | Asp | Gly | Phe | Arg | Gln | Ala | 340 | 345 | 350 |
| Ala | Phe | Cys | Cys | Val | Val | Ala | Gly | Ile | Phe | Val | Asp | Leu | Ala | Ala | Ala | 355 | 360 | 365 |
| Phe | Val | Val | His | Val | Phe | Gly | Asp | Ile | Gln | Asn | Leu | Gly | Glu | Gln | Pro | 370 | 375 | 380 |
| Ala | Gly | Lys | Arg | Gln | Ile | Val | Gly | Leu | Pro | Phe | Val | Gln | Leu | Arg | Gln | 385 | 390 | 395 |
| Tyr | Phe | Phe | Asn | Gln | Cys | Arg | Ala | Val | Val | Gly | Ser | Gly | Gln | Glu | Phe | 405 | 410 | 415 |
| Asp | Arg | Phe | Asp | Asn | Gln | Arg | Arg | Gly | Phe | Phe | Val | Gln | Glu | Val | Glu | 420 | 425 | 430 |
| Gln | Gly | Leu | Phe | Gln | Lys | Phe | Arg | Val | Arg | Arg | Gln | Ser | Arg | Val | Leu | 435 | 440 | 445 |
| Arg | Ile | Val | Gln | Asp | Met | Gln | Leu | His | Asp | Phe | Pro | Leu | Ile | Ala | Val | 450 | 455 | 460 |
| Asn | Thr | Val | Asn | Val | Pro | Gln | Met | Pro | His | Pro | Cys | Gln | Thr | Val | His | 465 | 470 | 475 |

Thr Leu Thr Thr His Val Pro Lys Cys Arg Leu Lys Leu Asn Ala Ala
 485 490 495
 Arg Arg Arg Arg Tyr Asn Arg Pro Gln Leu Phe Phe Ser Glu His His
 500 505 510
 His Asp Arg Asp Arg Thr Arg Gln Arg Arg Arg Thr Pro Ala Ala Val
 515 520 525
 Gln Pro Pro His Pro Leu Gly Arg Asn Arg His Arg Arg Ala Ala Glu
 530 535 540
 Ala Phe Arg Arg Ala Tyr Phe Gly Arg Arg Leu Arg Arg Ile Gly Arg
 545 550 555 560
 Arg Arg Pro Cys Pro Ile Ser Pro Pro Arg Gly Ser Ala Arg
 565 570

<210> 1395
 <211> 1727
 <212> DNA
 <213> Neisseria meningitidis

<400> 1395
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 catgtgaaag ccgaacacgg atacggaac gatgaggtct gccaaacggc cttcggcaag 240
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 gagtttggtg cggcgcgttt cgtgtgtctg ccacaagccc agcaggatag tgtcgatttc 840
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 gcggatgcgg cggttgaagc ttaagacggg ttggcggtgc acttcggtcg ggtgcgcggg 960
 caaaacggcg gtaacggagc tattgtccaa ctgccgctgc accgatttgc cgtcggcgtt 1020
 ccccgctttg agcctgcgga cggtttcctg caggctgcct tcgcgcgcgc cgcgtccggc 1080
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 tactttttca atcaatgccg cgtgtcgtc ggaagtggac aagagtttga ctgtttcgac 1260
 aaccaacggc gaggttctt cgtgcaggag gttgaacagg gattgtttca gaaattccgc 1320
 gtccgcgcc aaagccgcgt cctttggatt gttcagaata tgcagttgca tgatttttct 1380
 ctctcgtctg ccgtaaatat tgtaaatgta ccccaaatac cgcacccgtg ccaaaccgtt 1440
 cacactttaa ccgcccgtgt cccgaaatgc cgtctgaagt tgaacgccgc ccgacggcag 1500
 cgttacaatc gcccgcaact gtttttttcc gaacatcatc atgaccacga ccgaacacga 1560
 caacgacgat gcattcctgc tgcggtacag ccgccacatc ctcttgagc aaatcggcat 1620
 cgaagggcag cagaaacttt ccgccgcgca tattttggtc gtcggctgcg gcggtttggg 1680
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<210> 1396

<211> 575

<212> PRT

<213> *Neisseria meningitidis*

<400> 1396

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Val | Ala | Val | Cys | Asp | Lys | Arg | Ala | Val | Gln | Arg | Thr | Leu | Met | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gln | Phe | Ala | Gln | Gln | Gly | Gly | Leu | Phe | Leu | Leu | Phe | Val | Gln | Ala | Val |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Val | Val | Phe | Gln | Ala | Cys | Val | Leu | Glu | Lys | Leu | Gly | Asn | His | Ile | Gly |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Val | Phe | Ala | Cys | Val | Leu | Ala | Gln | Val | Glu | Arg | His | His | Val | Lys | Ala |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Glu | His | Gly | Tyr | Gly | Thr | Asp | Glu | Val | Cys | Gln | Thr | Ala | Phe | Gly | Lys |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gln | Thr | Ala | Ala | Val | Val | Asp | Lys | Gly | Thr | Leu | Gln | Phe | Phe | Gln | Ile |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ile | Gln | Lys | Leu | Leu | Cys | Arg | Ser | Ile | Arg | Leu | Glu | Lys | Ala | Glu | Phe |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Ala | Ala | His | Thr | Gln | Thr | Glu | Arg | Ala | Arg | Phe | Ala | His | Ser | Ala | Arg |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| His | Asn | Val | Gly | Asp | Gly | Ala | Ala | Val | Gly | Phe | Phe | Gly | Ala | Gly | Asp |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Phe | Phe | Val | Gly | Arg | Phe | Val | Gly | Gln | Arg | Arg | Tyr | Ile | Ala | Val | Asp |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Phe | Asp | Ala | Ala | Asp | Gly | Glu | Arg | Gln | Phe | Ala | Val | Glu | Phe | Val | Glu |
| | | | 165 | | | | | | 170 | | | | 175 | | |
| Phe | Ala | Ala | Ile | Glu | Ala | Glu | His | Gly | Ile | Gly | Val | Ala | Ala | Glu | Gly |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Lys | Ala | Gln | Gly | Phe | Gly | Arg | Asn | Lys | Arg | Ile | Ala | Val | Ala | Val | Ala |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Ala | Asp | Pro | Ala | Ala | Asp | Phe | Glu | Asp | Val | Arg | Asn | Ala | Asp | Ala | Gly |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Ile | Gly | Arg | Leu | Lys | Val | Val | Phe | His | Leu | Ala | Val | Glu | Leu | Gly | Gln |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Gly | Phe | Glu | Lys | Ala | His | Arg | Glu | Asp | Gly | His | Ala | Val | Val | Asp | Phe |
| | | | 245 | | | | | | 250 | | | | | 255 | |
| Val | Val | Asp | Ala | Glu | Phe | Val | Ala | Ala | Arg | Phe | Ala | Gly | Leu | Pro | Gln |
| | | | 260 | | | | | 265 | | | | | 270 | | |

| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Gln | Gln | Asp | Ser | Val | Asp | Phe | Ala | Ala | Gln | Pro | Cys | Gln | Arg | Val | 275 | 280 | 285 |
| Gly | Ile | Gly | Ala | Ala | Phe | Ala | Leu | Arg | Gln | Gln | Cys | Ala | Asp | Ala | Ala | 290 | 295 | 300 |
| Val | Glu | Ala | Xaa | Asp | Gly | Leu | Ala | Leu | His | Phe | Gly | Arg | Val | Arg | Gly | 305 | 310 | 315 |
| Gln | Asn | Gly | Gly | Asn | Gly | Arg | Ile | Val | Gln | Leu | Pro | Leu | His | Arg | Phe | 325 | 330 | 335 |
| Ala | Val | Gly | Phe | Pro | Arg | Phe | Glu | Pro | Ala | Asp | Gly | Phe | Arg | Gln | Ala | 340 | 345 | 350 |
| Ala | Phe | Arg | Ala | Ala | Ala | Ser | Gly | Phe | Phe | Val | Asp | Leu | Ala | Ala | Ala | 355 | 360 | 365 |
| Phe | Val | Val | His | Val | Phe | Gly | Asp | Val | Gln | Asn | Leu | Gly | Glu | Gln | Ala | 370 | 375 | 380 |
| Ala | Gly | Gln | Gly | Xaa | Ile | Val | Gly | Leu | Leu | Phe | Val | Gln | Leu | Arg | Gln | 385 | 390 | 395 |
| Tyr | Phe | Phe | Asn | Gln | Cys | Arg | Ala | Val | Val | Gly | Ser | Gly | Gln | Glu | Phe | 405 | 410 | 415 |
| Asp | Cys | Phe | Asp | Asn | Gln | Arg | Arg | Gly | Phe | Phe | Val | Gln | Glu | Val | Glu | 420 | 425 | 430 |
| Gln | Gly | Leu | Phe | Gln | Lys | Phe | Arg | Val | Arg | Arg | Gln | Ser | Arg | Val | Leu | 435 | 440 | 445 |
| Trp | Ile | Val | Gln | Asn | Met | Gln | Leu | His | Asp | Phe | Ser | Leu | Ser | Ser | Ala | 450 | 455 | 460 |
| Val | Asn | Ile | Val | Asn | Val | Pro | Gln | Met | Pro | His | Pro | Cys | Gln | Thr | Val | 465 | 470 | 475 |
| His | Thr | Leu | Thr | Ala | Arg | Val | Pro | Lys | Cys | Arg | Leu | Lys | Leu | Asn | Ala | 485 | 490 | 495 |
| Ala | Arg | Arg | Gln | Arg | Tyr | Asn | Arg | Pro | Gln | Leu | Phe | Phe | Ser | Glu | His | 500 | 505 | 510 |
| His | His | Asp | His | Asp | Arg | Thr | Arg | Gln | Arg | Arg | Cys | Ile | Pro | Ala | Ala | 515 | 520 | 525 |
| Val | Gln | Pro | Pro | His | Pro | Leu | Gly | Arg | Asn | Arg | His | Arg | Arg | Ala | Ala | 530 | 535 | 540 |
| Glu | Thr | Phe | Arg | Arg | Ala | Tyr | Phe | Gly | Arg | Arg | Leu | Arg | Arg | Phe | Gly | 545 | 550 | 555 |
| Cys | Arg | Arg | Thr | Xaa | Pro | Thr | Leu | Pro | Leu | Arg | Val | Ser | Ala | Arg | | 565 | 570 | 575 |

<210> 1397
 <211> 1723
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1397
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 gaaaagctcg gcaaccacat cggcgtgttt gcctgcgtgt tggcgcaggt cgagcggcat 180
 catgtggaag ccgaacacgg atacggaacg gatgaggtct gccaaacggc cttcggcaag 240
 cagggcggtg ccgtttgtcg taagggaatg ttgcaatttt ttcaaatacat cgagaaattc 300
 ttgtgccgaa gcataaggct cgagaaagcc gaatttgcag cccataccca aaccgagcgc 360
 gcgcgctttg cccatagcgc gcgccataat gtaggcaatg gcgcgacggt agggttcttc 420
 ggcgcggggc gtttcttcgt cgggcgattt gtcggacaac gccatcacat cgccgttgac 480
 tttgacgcgg cggatggaga gcggcagttc gcggtagagt ttgtcgagtt cgccacggta 540
 aaaaacggaac acggcatcgg cgtggcggcg gaaggcaaaa cgcaagggtt cggcagaaac 600
 gaacggattg ccgtcgcggt cgccgccgat ccagccgcgc attttgagga tgtccggaac 660
 gcggacatcg ggataggccg tctgaaagtc gtgttccatc ttgcggtaga gcttgggcag 720
 ggcttcaaaa aagctcatcg gaaagatgga cagccggttg ttgatttcgt cgttgacgct 780
 gagtttgtgg cggcgcgttt cgctggtctg ccacaagccc agcaggatag tgtcgatttc 840
 gcggcgcagc cgtgccagcg cgtcggcatt ggtacagcgt tcgcgttgcg gcagcagcgc 900
 gcggatgcgg cggttgaaat tcaagacggt ctggcggtgc acttcggtcg ggtgcgcggt 960
 caaaaacgcg gtaacggacg tattgtccaa ctgccgctgc accgatttgc cgtcggcttt 1020
 ccccgctttg agcctgcgga cggtttccgt caggctgcct tcgcgcgcgc cgcgtccggc 1080
 ttcttcgtgg atttggcggc ggcttctgtg gtgcacgtct tcggcgatgt tcaaaatctg 1140
 ggcaacagg ccgcaggcca aggttaaatac gtgggtttgt tgttcgtcca attgcggcaa 1200
 tactttttca atcaatgccg cgtgtcgtc ggaagtggac aagagtttga ccgtttcgac 1260
 aaccaacggc gaggttctt cgtgcaggag gttgaacagg gattgtttca gaaattccgc 1320
 gtccgcgcgc aaagccgcgt cctttggatt gttcagaata tgcagttgca tgatttttct 1380
 ctcatcgccg taaatactgt aaatgtacct caaatgccgc atccgtgcc aaccgttcac 1440
 actttaaccg cccgtgtccc gaaatgccgt ctgaagttga acgcgcgccg acggcagcgt 1500
 tacaatcgcc cacaactgtt ttttccgaac atcatcatga ccacgaccga acacgacaac 1560
 gacgatgcac tcctgctgcg gtacagccgc cacatcctct tggacgaaat tggcatcgaa 1620
 ggcagcaga aactttccgc cgcgcataatt ttggtcgtcg gctgcggcgg tttgggtgcc 1680
 gccgccctgc cctatctcgc cgcttccggc atcggcacgc tga 1723

<210> 1398
 <211> 573
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1398
 Met Val Ala Val Cys Asp Glu Arg Thr Val Gln Trp Thr Leu Met Ala
 1 5 10 15
 Gln Phe Ala Gln Gln Gly Gly Leu Phe Leu Leu Phe Val Glu Ala Val
 20 25 30
 Val Val Phe Gln Ala Cys Val Leu Glu Lys Leu Gly Asn His Ile Gly
 35 40 45
 Val Phe Ala Cys Val Leu Ala Gln Val Glu Arg His His Val Glu Ala
 50 55 60
 Glu His Gly Tyr Gly Thr Asp Glu Val Cys Gln Thr Ala Phe Gly Lys

| 65 | 70 | 75 | 80 |
|---|-----|-----|-----|
| Gln Ala Ala Ala Val Val Asp Lys Gly Met Leu Gln Phe Phe Gln Ile | 85 | 90 | 95 |
| Ile Glu Lys Phe Leu Cys Arg Ser Ile Arg Leu Glu Lys Ala Glu Phe | 100 | 105 | 110 |
| Ala Ala His Thr Gln Thr Glu Arg Ala Arg Phe Ala His Ser Ala Arg | 115 | 120 | 125 |
| His Asn Val Gly Asn Gly Ala Thr Val Gly Phe Phe Gly Ala Gly Gly | 130 | 135 | 140 |
| Phe Phe Val Gly Arg Phe Val Gly Gln Arg His His Ile Ala Val Asp | 145 | 150 | 155 |
| Phe Asp Ala Ala Asp Gly Glu Arg Gln Phe Ala Val Glu Phe Val Glu | 165 | 170 | 175 |
| Phe Ala Thr Val Lys Thr Glu His Gly Ile Gly Val Ala Ala Glu Gly | 180 | 185 | 190 |
| Lys Thr Gln Gly Phe Gly Arg Asn Glu Arg Ile Ala Val Ala Val Ala | 195 | 200 | 205 |
| Ala Asp Pro Ala Ala Asp Phe Glu Asp Val Arg Asn Ala Asp Ile Gly | 210 | 215 | 220 |
| Ile Gly Arg Leu Lys Val Val Phe His Leu Ala Val Glu Leu Gly Gln | 225 | 230 | 235 |
| Gly Phe Lys Lys Ala His Arg Lys Asp Gly His Ala Val Val Asp Phe | 245 | 250 | 255 |
| Val Val Asp Ala Glu Phe Val Ala Ala Arg Phe Ala Gly Leu Pro Gln | 260 | 265 | 270 |
| Ala Gln Gln Asp Ser Val Asp Phe Ala Ala Gln Pro Cys Gln Arg Val | 275 | 280 | 285 |
| Gly Ile Gly Thr Ala Phe Ala Leu Arg Gln Gln Arg Ala Asp Ala Ala | 290 | 295 | 300 |
| Val Glu Ile Gln Asp Gly Leu Ala Leu His Phe Gly Arg Val Arg Gly | 305 | 310 | 315 |
| Gln Asn Gly Gly Asn Gly Arg Ile Val Gln Leu Pro Leu His Arg Phe | 325 | 330 | 335 |
| Ala Val Gly Phe Pro Arg Phe Glu Pro Ala Asp Gly Phe Arg Gln Ala | 340 | 345 | 350 |
| Ala Phe Arg Ala Ala Ala Ser Gly Phe Phe Val Asp Leu Ala Ala Ala | 355 | 360 | 365 |
| Phe Val Val His Val Phe Gly Asp Val Gln Asn Leu Gly Glu Gln Ala | | | |

| | | |
|---|-----|-------------|
| 370 | 375 | 380 |
| Ala Gly Gln Gly Ile Val Gly Leu Leu Phe Val Gln Leu Arg Gln Tyr | | |
| 385 | 390 | 395 400 |
| Phe Phe Asn Gln Cys Arg Ala Val Val Gly Ser Gly Gln Glu Phe Asp | | |
| | 405 | 410 415 |
| Arg Phe Asp Asn Gln Arg Arg Gly Phe Phe Val Gln Glu Val Glu Gln | | |
| | 420 | 425 430 |
| Gly Leu Phe Gln Lys Phe Arg Val Arg Arg Gln Ser Arg Val Leu Trp | | |
| | 435 | 440 445 |
| Ile Val Gln Asn Met Gln Leu His Asp Phe Ser Leu Ile Ala Val Asn | | |
| | 450 | 455 460 |
| Thr Val Asn Val Pro Gln Met Pro His Pro Cys Gln Thr Val His Thr | | |
| | 465 | 470 475 480 |
| Leu Thr Ala Arg Val Pro Lys Cys Arg Leu Lys Leu Asn Ala Ala Arg | | |
| | 485 | 490 495 |
| Arg Gln Arg Tyr Asn Arg Pro Gln Leu Phe Xaa Ser Glu His His His | | |
| | 500 | 505 510 |
| Asp His Asp Arg Thr Arg Gln Arg Arg Cys Ile Pro Ala Ala Val Gln | | |
| | 515 | 520 525 |
| Pro Pro His Pro Leu Gly Arg Asn Trp His Arg Arg Ala Ala Glu Thr | | |
| | 530 | 535 540 |
| Phe Arg Arg Ala Tyr Phe Gly Arg Arg Leu Arg Arg Phe Gly Cys Arg | | |
| | 545 | 550 555 560 |
| Xaa Pro Cys Pro Ile Ser Pro Leu Pro Ala Ser Ala Arg | | |
| | 565 | 570 |

<210> 1399
 <211> 399
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1399
 atgccttcgc ggacaccgca gggaaaaagg ggttattcct gccccaagcg ggatagtgcc 60
 ttttggcagg cgttgtccat atcggttatt ttacgcgcaa aatcgccgat tgccaaatcg 120
 ccgcggttca gggaggtttt caataggtcg tggacgacgt tgagcgcggc cataatgacg 180
 attttttcgc tgtccgcgac gcggccgcct tcgcggatgg cttcggcttt gccgttgagc 240
 attccgactg cctgcaacag tgtgtctttt tcttctgcg gcgtgttgac agtcagcccg 300
 ggcgtgcatg acttcgatgt agacttggtc gatgttcac ctttaatcct tattgctgcg 360
 tttcctgcg ttgggggagg cgcgctgcc gtgcgctga 399

<210> 1400
 <211> 132

<212> PRT
<213> Neisseria gonorrhoeae

<400> 1400

```
Met Pro Ser Arg Thr Pro Gln Gly Lys Arg Gly Tyr Ser Cys Pro Lys
 1              5              10              15

Arg Asp Ser Ala Phe Trp Gln Ala Leu Ser Ile Ser Val Ile Leu Arg
          20              25              30

Ala Lys Ser Pro Ile Ala Lys Ser Pro Pro Phe Arg Glu Val Phe Asn
          35              40              45

Arg Ser Trp Thr Thr Leu Ser Ala Ala Ile Met Thr Ile Phe Ser Leu
 50              55              60

Ser Ala Thr Arg Pro Pro Ser Arg Met Ala Ser Ala Leu Pro Leu Ser
 65              70              75              80

Ile Pro Thr Ala Cys Asn Ser Val Ser Phe Ser Ser Ala Gly Val Leu
          85              90              95

Thr Val Ser Arg Gly Val His Asp Phe Asp Val Asp Leu Phe Asp Val
          100              105              110

His Pro Leu Ile Leu Ile Ala Ala Phe Pro Ala Val Gly Gly Gly Ala
          115              120              125

Leu Pro Val Arg
          130
```

<210> 1401
<211> 399
<212> DNA
<213> Neisseria meningitidis

<400> 1401

```
atgccttcgc ggacaccgca gggnaaaagg gggtattcct gcgccaagcg ggatagtgct 60
ttttggcagg cgttgtccat atcggtatt ttacgcgcaa aatcgccgat tgccaaatcg 120
ccgcggttca gggaggtttt caacaggtcg tggacgacgt tgagcgcggc cataatgacg 180
attttttcgc tgtcgcgcac gcgtccgcct tcgcggatgg cttcggttt gccgttgagc 240
attccgactg cctgcaacag tgtgtctttt tcttctgccg gcgtgttgac ggtcagccgg 300
ggcgtgcawg acttcsatgt ggacttgttc gatgttcac ctttaatcct tattgctgcg 360
tttctgcca ttgggggagg cgcgctgcca gtgcgctga 399
```

<210> 1402
<211> 132
<212> PRT
<213> Neisseria meningitidis

<400> 1402

```
Met Pro Ser Arg Thr Pro Gln Gly Lys Arg Gly Tyr Ser Cys Ala Lys
 1              5              10              15

Arg Asp Ser Ala Phe Trp Gln Ala Leu Ser Ile Ser Ala Ile Leu Arg
```

| | | |
|---|-----|-----|
| 20 | 25 | 30 |
| Ala Lys Ser Pro Ile Ala Lys Ser Pro Pro Phe Arg Glu Val Phe Asn | | |
| 35 | 40 | 45 |
| Arg Ser Trp Thr Thr Leu Ser Ala Ala Ile Met Thr Ile Phe Ser Leu | | |
| 50 | 55 | 60 |
| Ser Ala Thr Arg Pro Pro Ser Arg Met Ala Ser Ala Leu Pro Leu Ser | | |
| 65 | 70 | 75 |
| Ile Pro Thr Ala Cys Asn Ser Val Ser Phe Ser Ser Ala Gly Val Leu | | |
| 85 | 90 | 95 |
| Thr Val Ser Arg Gly Val Xaa Asp Phe Xaa Val Asp Leu Phe Asp Val | | |
| 100 | 105 | 110 |
| His Pro Leu Ile Leu Ile Ala Ala Phe Pro Ala Ile Gly Gly Gly Ala | | |
| 115 | 120 | 125 |
| Leu Pro Val Arg | | |
| 130 | | |

<210> 1403
 <211> 398
 <212> DNA

<213> Neisseria meningitidis

<400> 1403
 atgccttcgc ggacaccgca gggaaaaaagg gggtattcct gcgccaagcg ggatagtgct 60
 ttttggcagg cggtgtccat atcggtatt ttacgcgcaa aatcgccgat tgccaaatcg 120
 ccgcggttca gggagggttt caacagggtcg tggacgacgt tgagcgcggc cataatgacg 180
 attttttcgc tgtccgcgac gcgtccgcct tcgcggatgg cttcggtttt gccgttgagc 240
 attccgactg cctgcaacag tgtgtctttt tcttctgccg gcgtgttgac ggtcagcccg 300
 gcgtgcatga cttcgatgtg gacttggtcg atgttcatcc tttaatcctt attgctgcgt 360
 ttctgcccgt tgggggaggc gcgctgccag tgcgctga 398

<210> 1404
 <211> 132
 <212> PRT
 <213> Neisseria meningitidis

| |
|---|
| <400> 1404 |
| Met Pro Ser Arg Thr Pro Gln Gly Lys Arg Gly Tyr Ser Cys Ala Lys |
| 1 5 10 15 |
| Arg Asp Ser Ala Phe Trp Gln Ala Leu Ser Ile Ser Ala Ile Leu Arg |
| 20 25 30 |
| Ala Lys Ser Pro Ile Ala Lys Ser Pro Pro Phe Arg Glu Val Phe Asn |
| 35 40 45 |
| Arg Ser Trp Thr Thr Leu Ser Ala Ala Ile Met Thr Ile Phe Ser Leu |
| 50 55 60 |

Ser Ala Thr Arg Pro Pro Ser Arg Met Ala Ser Ala Leu Pro Leu Ser
65 70 75 80

Ile Pro Thr Ala Cys Asn Ser Val Ser Phe Ser Ser Ala Gly Val Leu
85 90 95

Thr Val Ser Arg Xaa Val His Asp Phe Asp Val Asp Leu Phe Asp Val
100 105 110

His Pro Leu Ile Leu Ile Ala Ala Phe Pro Ala Val Gly Gly Gly Ala
115 120 125

Leu Pro Val Arg
130

<210> 1405
<211> 834
<212> DNA
<213> Neisseria meningitidis

<400> 1405
atgaaagtgc ttgttttagg tgcgggtggt gccggcggtat cctccgtgtg gtatctggca 60
gaggccggac atgaagtaac ggtcatcgac cgcaccgagg gtgtggcgat ggaaaccagt 120
tttgccaatg caggccagct ttcttacggc tataccacgc cttgggctgc acccggtatt 180
ccgaccaaag cactgaaacg gctgtttaaa agccatccgc ctttactgtt ccgccctgac 240
ggcggcctgt atcaaatacga atggctgtgg cggatgctgc aaaactgcac ggcaacgcgc 300
tatcaaatacga ataaagagcg catggtcagg atttccgaat acagccgtga aatgttccgc 360
cgttttgaag cgcaaaccga catgaatttt gagggacgca aaaaagggac gttgcagatt 420
ttccgcaaaa ccgaagaagt cgaagcggca aaacaagaca ttgccgtttt ggaacgtac 480
ggcgtgcggt accgccgtct gaagcccgaa gaatgcgcag aattcgagcc tgcgctggca 540
cgcgttaccg ccaaaattgt cggcgggtctg cactgcctg cggatgcgac cggcgactgc 600
cgctcttcca ccgaaaacct gtacaaattg tgtcaagaga agggggtacg gttctacttc 660
aaccaaaacca tcagccgcat cgaccacaac gggctgcgca tcaaagccgt tgaaacgaaa 720
cagggcggtt tgaacagat gccgttgtct gcgcgctcgg ctgcttcagc aggactgtgt 780
tggcgcagtt ggatctcaat ctgccattt atcccgtaa aggtatttcc ttga 834

<210> 1406
<211> 277
<212> PRT
<213> Neisseria meningitidis

<400> 1406
Met Lys Val Leu Val Leu Gly Ala Gly Val Ala Gly Val Ser Ser Val
1 5 10 15

Trp Tyr Leu Ala Glu Ala Gly His Glu Val Thr Val Ile Asp Arg Thr
20 25 30

Glu Gly Val Ala Met Glu Thr Ser Phe Ala Asn Ala Gly Gln Leu Ser
35 40 45

Tyr Gly Tyr Thr Thr Pro Trp Ala Ala Pro Gly Ile Pro Thr Lys Ala
50 55 60

Leu Lys Arg Leu Phe Lys Ser His Pro Pro Leu Leu Phe Arg Pro Asp
 65 70 75 80
 Gly Gly Leu Tyr Gln Ile Glu Trp Leu Trp Arg Met Leu Gln Asn Cys
 85 90 95
 Thr Ala Thr Arg Tyr Gln Ile Asn Lys Glu Arg Met Val Arg Ile Ser
 100 105 110
 Glu Tyr Ser Arg Glu Met Phe Arg Arg Phe Glu Ala Gln Thr Asp Met
 115 120 125
 Asn Phe Glu Gly Arg Lys Lys Gly Thr Leu Gln Ile Phe Arg Gln Thr
 130 135 140
 Glu Glu Val Glu Ala Ala Lys Gln Asp Ile Ala Val Leu Glu Arg Tyr
 145 150 155 160
 Gly Val Pro Tyr Arg Arg Leu Lys Pro Glu Glu Cys Ala Glu Phe Glu
 165 170 175
 Pro Ala Leu Ala Arg Val Thr Ala Lys Ile Val Gly Gly Leu His Leu
 180 185 190
 Pro Ala Asp Ala Thr Gly Asp Cys Arg Leu Phe Thr Glu Asn Leu Tyr
 195 200 205
 Lys Leu Cys Gln Glu Lys Gly Val Arg Phe Tyr Phe Asn Gln Thr Ile
 210 215 220
 Ser Arg Ile Asp His Asn Gly Leu Arg Ile Lys Ala Val Glu Thr Lys
 225 230 235 240
 Gln Gly Gly Leu Lys Gln Met Pro Leu Ser Ala Arg Ser Ala Ala Ser
 245 250 255
 Ala Gly Leu Cys Trp Arg Ser Trp Ile Ser Ile Cys Pro Phe Ile Pro
 260 265 270
 Ser Lys Ala Ile Pro
 275

<210> 1407

<211> 369

<212> DNA

<213> Neisseria meningitidis

<400> 1407

gttttggaac gctacggcgt gccgtaccgc cgtctgaaac ccgaagaatg tgcagaattt 60
 gagcctgcgc tggcacgcgt tacgcgcaaa attgccggcg gcctgcacct gcctgcagat 120
 gcgaccggcg actggcgccct cttcactgaa aacctataca aattgtgtca ggaaaagggc 180
 gtacgggtttc atttcaacca aaacatcagc cgcacgcgacc acaacgggct gcgcatcaaa 240
 accgttgaaa ccaaacaggg cggtttgaag cagatgccgt tgtctgcgcg ctcggttgct 300
 tcagcaggac ggttttggcg cagttggatc tcaatctgcc catttatccc gtcaaaggct 360
 attccttga 369

<210> 1408
 <211> 122
 <212> PRT
 <213> Neisseria meningitidis

<400> 1408
 Val Leu Glu Arg Tyr Gly Val Pro Tyr Arg Arg Leu Lys Pro Glu Glu
 1 5 10 15
 Cys Ala Glu Phe Glu Pro Ala Leu Ala Arg Val Thr Ala Lys Ile Ala
 20 25 30
 Gly Gly Leu His Leu Pro Ala Asp Ala Thr Gly Asp Trp Arg Leu Phe
 35 40 45
 Thr Glu Asn Leu Tyr Lys Leu Cys Gln Glu Lys Gly Val Arg Phe His
 50 55 60
 Phe Asn Gln Asn Ile Ser Arg Ile Asp His Asn Gly Leu Arg Ile Lys
 65 70 75 80
 Thr Val Glu Thr Lys Gln Gly Gly Leu Lys Gln Met Pro Leu Ser Ala
 85 90 95
 Arg Ser Val Ala Ser Ala Gly Arg Phe Trp Arg Ser Trp Ile Ser Ile
 100 105 110
 Cys Pro Phe Ile Pro Ser Lys Ala Ile Pro
 115 120

<210> 1409
 <211> 834
 <212> DNA
 <213> Neisseria meningitidis

<400> 1409
 atgaaagtgc ttgttttagg tgctggtggt gccggcggtat cttccgcgtg gtatctggca 60
 gaggcaggac atgaagtaac ggtcatcgac cgcgccgagg gcgtggcgat ggaaaccagt 120
 ttgtccaacg caggccagct ttcttacggc tataccacgc cttgggctgc acccggtatt 180
 ccgaccaaag cactgaaatg gctgttttaa agccatccgc ctttgcgtgt tcgccccgac 240
 ggcagcctgt atcaaatega atggctgtgg cagatgctgc aacactgcac ggcagcgcgc 300
 tatcaaatac ataaagagcg catggtcagg atgtccgaat acagccgtga aatgttccgc 360
 cgttttgaag cgcaaaccgg catgaatttt gagggacgca aaaaaggagac gttgcagatt 420
 ttccgccaaa ccaaagaagt cgaagcggca aaacaagaca ttgccgtttt ggaacgctac 480
 ggcgtgcccgt accgccgtct gaagcccga gaatgcgcag aattcgagcc tgcgctggca 540
 cgcggtaccg ccaaaattgc cggcgccctg cacctgcccg cagacgcgac cggcgactgc 600
 cgctctttca ctgaaaacct gtacaaattg tgtcaggaaa agggcgctac gtttcatattc 660
 aaccaaacca tcagccgcat cgaccacaac gggctgcgca tcaaaaccgt tgaaacgaaa 720
 cagggcggtt tgaagcagat gccgttgtct gcgcgctcgg ctgcttcagc aggacggttt 780
 tggcgcaagt ggatctcaat ctgccgattt atcccgctca aggctattcc ttga 834

<210> 1410
 <211> 277

<212> PRT

<213> Neisseria meningitidis

<400> 1410

Met Lys Val Leu Val Leu Gly Ala Gly Val Ala Gly Val Ser Ser Ala
1 5 10 15

Trp Tyr Leu Ala Glu Ala Gly His Glu Val Thr Val Ile Asp Arg Ala
20 25 30

Glu Gly Val Ala Met Glu Thr Ser Phe Ala Asn Ala Gly Gln Leu Ser
35 40 45

Tyr Gly Tyr Thr Thr Pro Trp Ala Ala Pro Gly Ile Pro Thr Lys Ala
50 55 60

Leu Lys Trp Leu Phe Lys Ser His Pro Pro Leu Leu Phe Arg Pro Asp
65 70 75 80

Gly Ser Leu Tyr Gln Ile Glu Trp Leu Trp Gln Met Leu Gln His Cys
85 90 95

Thr Ala Ala Arg Tyr Gln Ile Asn Lys Glu Arg Met Val Arg Met Ser
100 105 110

Glu Tyr Ser Arg Glu Met Phe Arg Arg Phe Glu Ala Gln Thr Gly Met
115 120 125

Asn Phe Glu Gly Arg Lys Lys Gly Thr Leu Gln Ile Phe Arg Gln Thr
130 135 140

Lys Glu Val Glu Ala Ala Lys Gln Asp Ile Ala Val Leu Glu Arg Tyr
145 150 155 160

Gly Val Pro Tyr Arg Arg Leu Lys Pro Glu Glu Cys Ala Glu Phe Glu
165 170 175

Pro Ala Leu Ala Arg Val Thr Ala Lys Ile Ala Gly Gly Leu His Leu
180 185 190

Pro Ala Asp Ala Thr Gly Asp Cys Arg Leu Phe Thr Glu Asn Leu Tyr
195 200 205

Lys Leu Cys Gln Glu Lys Gly Val Arg Phe His Phe Asn Gln Thr Ile
210 215 220

Ser Arg Ile Asp His Asn Gly Leu Arg Ile Lys Thr Val Glu Thr Lys
225 230 235 240

Gln Gly Gly Leu Lys Gln Met Pro Leu Ser Ala Arg Ser Ala Ala Ser
245 250 255

Ala Gly Arg Phe Trp Arg Lys Trp Ile Ser Ile Cys Arg Phe Ile Pro
260 265 270

Ser Lys Ala Ile Pro
275

<210> 1411
 <211> 576
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1411
 atgggttccg cgccgaacgc cgccgcgcgc gccgaagtga aacaccctgt ttcgcaaggt 60
 atgattcaaa tgctgggcgt gtttgtcgat accatcatcg tttgttcttg caccgccttc 120
 atcatcttga tttaccaaca gccttatggc gatttgagcg gtgcggcgct gacgcaggcg 180
 gcgattgtca gccaaagtggg gcaatggggc gcgggtttcc tcgccgtcat cctgtttatg 240
 tttgcctttt ccaccgttat cgccaactat gcctatgccg agtccaacgt ccaattcatc 300
 aaaagccatt ggctgattac cgccgttttc cgtatgctgg ttttggcgtg ggtctatttc 360
 ggcgcggttg ccaatgtgcc tttggtctgg gatatggcgg atatggcgat gggcatcatg 420
 gcgtggatca acctcgtcgc catcctgctg ctctcgccat tggcgtttat gctgctgcgc 480
 gattacaccg ccaagctgaa aatgggcaaa gaccccgagt tcaaactttc cgaacatccg 540
 ggctgaaac gccgcatcaa atccgatgtt tggtaa 576

<210> 1412
 <211> 191
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1412
 Met Gly Ser Ala Pro Asn Ala Ala Ala Ala Glu Val Lys His Pro
 1 5 10 15
 Val Ser Gln Gly Met Ile Gln Met Leu Gly Val Phe Val Asp Thr Ile
 20 25 30
 Ile Val Cys Ser Cys Thr Ala Phe Ile Ile Leu Ile Tyr Gln Gln Pro
 35 40 45
 Tyr Gly Asp Leu Ser Gly Ala Ala Leu Thr Gln Ala Ala Ile Val Ser
 50 55 60
 Gln Val Gly Gln Trp Gly Ala Gly Phe Leu Ala Val Ile Leu Phe Met
 65 70 75 80
 Phe Ala Phe Ser Thr Val Ile Gly Asn Tyr Ala Tyr Ala Glu Ser Asn
 85 90 95
 Val Gln Phe Ile Lys Ser His Trp Leu Ile Thr Ala Val Phe Arg Met
 100 105 110
 Leu Val Leu Ala Trp Val Tyr Phe Gly Ala Val Ala Asn Val Pro Leu
 115 120 125
 Val Trp Asp Met Ala Asp Met Ala Met Gly Ile Met Ala Trp Ile Asn
 130 135 140
 Leu Val Ala Ile Leu Leu Leu Ser Pro Leu Ala Phe Met Leu Leu Arg
 145 150 155 160
 Asp Tyr Thr Ala Lys Leu Lys Met Gly Lys Asp Pro Glu Phe Lys Leu

165

170

175

Ser Glu His Pro Gly Leu Lys Arg Arg Ile Lys Ser Asp Val Trp
 180 185 190

<210> 1413

<211> 576

<212> DNA

<213> Neisseria meningitidis

<400> 1413

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atgggttcg cgccgaacgc cgccgccgcc gccgaagtga aacaccctgt ttcgcaaggt 60
atgattcaaa tgctgggcgt gttgtcgat accatcatcg tttgttcttg caccgccttc 120
atcatcttga tttaccaaca gccttatggc gatttgagcg gtgcggcgct gacgcaggcg 180
gcgattgtca gccaaagtgg gcaatggggc gcgggtttcc tcgccgtcat cctgtttatg 240
tttgcctttt ccaccgttat cgccaactat gcctatgccg agtccaacgt ccaattcatc 300
aaaagccatt ggctgattac cgccgttttc cgtatgctgg ttttggcggt ggtctatttc 360
ggcgcggttg ccaatgtgcc tttggtctgg gatatggcgg atatggcgat gggcatcatg 420
gcgtgatca acctcgtcgc catcctgctg ctctcgccat tggcgtttat gctgctgcgc 480
gattacaccg ccaagctgaa aatgggcaaa gaccccgagt tcaaactttc cgaacatccg 540
ggcctgaaac gccgcatcaa atccgatgtt tggtaa 576

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<210> 1414

<211> 191

<212> PRT

<213> Neisseria meningitidis

<400> 1414

```

Met Gly Ser Ala Pro Asn Ala Ala Ala Ala Glu Val Lys His Pro
  1           5           10           15

Val Ser Gln Gly Met Ile Gln Met Leu Gly Val Phe Val Asp Thr Ile
      20           25           30

Ile Val Cys Ser Cys Thr Ala Phe Ile Ile Leu Ile Tyr Gln Gln Pro
      35           40           45

Tyr Gly Asp Leu Ser Gly Ala Ala Leu Thr Gln Ala Ala Ile Val Ser
      50           55           60

Gln Val Gly Gln Trp Gly Ala Gly Phe Leu Ala Val Ile Leu Phe Met
      65           70           75           80

Phe Ala Phe Ser Thr Val Ile Gly Asn Tyr Ala Tyr Ala Glu Ser Asn
      85           90           95

Val Gln Phe Ile Lys Ser His Trp Leu Ile Thr Ala Val Phe Arg Met
      100          105          110

Leu Val Leu Ala Trp Val Tyr Phe Gly Ala Val Ala Asn Val Pro Leu
      115          120          125

Val Trp Asp Met Ala Asp Met Ala Met Gly Ile Met Ala Trp Ile Asn
      130          135          140

```

Leu Val Ala Ile Leu Leu Leu Ser Pro Leu Ala Phe Met Leu Leu Arg
 145 150 155 160
 Asp Tyr Thr Ala Lys Leu Lys Met Gly Lys Asp Pro Glu Phe Lys Leu
 165 170 175
 Ser Glu His Pro Gly Leu Lys Arg Arg Ile Lys Ser Asp Val Trp
 180 185 190

<210> 1415
 <211> 1428
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1415
 atgaacgaga actttaccga atggctgcac ggctgggtcg gcgccatcaa cgatccgatg 60
 tggtcatact tggtttatnt gcttttgggt acggggcctt tcttcaccgt aaccacgggc 120
 tttgtccaat tccgcctggt cgggcgcgagc atcaaagaaa tgctcggcgg ccgcaaacag 180
 ggggacgacc ctcacggcat cacgccgttt caggcatttg taaccggcct tgccagccgc 240
 gtgggcgtgg gcaatatcgc gggcgtggcc atcgccatca aagtcggcgg accgggcgcg 300
 gtgttttgga tgtgggtaac cgccttaatc ggtatgagtt cggcgtttgt cgaatcttcg 360
 ctggcgcgagc tctttaaaagt ccgcgactac gacaaccacc atttcggggg cggccctgcc 420
 tactacatca ctcaagggct ggggcagaaa tggctgggcg tgttggtcgc cctgagcctg 480
 attttctgtt tcggccttgt gtttgaagcg gttcagacca ataccattgc cgataccgtc 540
 aaagcggcgt ggggttggga gcctcattat gtcggcgctg ccctgggtgat ttttaaccgcg 600
 ccgattatct tcggcgggcat caggcgcata tctaaagcgg cggaaatcgt cgtccccctg 660
 atggcggttt tgtacctctt tatcgcgctt ttcattcatt tgaccaatat tccgatgatt 720
 ccggacgtgt tcggtcagat tttttcgggc gcgttcaa atcgacgcggc agcaggcggc 780
 ttactcggcg gtctgatttc gcaaacgatg atgatgggca tcaaacgcgg cctgtattcc 840
 aacgaggcgg gtatgggttc cgcgcgaac gccgcgcgcg ccgccaagt gaaacaccct 900
 gtttcgcaag gtatgattca aatgctgggc gtgtttgtcg ataccatcat cgtttgttct 960
 tgcaccgcct tcatcatctt gatttacc aaagccttac gcgatttgag cgggtgcggcg 1020
 ctgacgcagg cggcgattgt cagccaagt gggcaatggg gcgcgggctt cctcgccgtc 1080
 atcctgttta tgtttgcctt ttccaccgtt atcggcaact atgcctatgc cgagtccaac 1140
 gtccaattca tcaaaagcca ttggctgatt accgccgttt tccgtatgct ggttttggcg 1200
 tgggtctatt tcggcgcggt tgccaatgtg ccttttgtct gggatatggc ggatatggcg 1260
 atgggcatta tggcgtggat caacctgtc gccatcctgc tgctctcgcc cttggcggtt 1320
 atgctgctgc gcgattacac cgccaagctg aaaatgggca aagaccccg gttcaaactt 1380
 tccgaacatc cgggcctgaa acgccgtatc aaatccgacg tttggtaa 1428

<210> 1416
 <211> 475
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1416
 Met Asn Glu Asn Phe Thr Glu Trp Leu His Gly Trp Val Gly Ala Ile
 1 5 10 15
 Asn Asp Pro Met Trp Ser Tyr Leu Val Tyr Xaa Leu Leu Gly Thr Gly
 20 25 30
 Leu Phe Phe Thr Val Thr Thr Gly Phe Val Gln Phe Arg Leu Phe Gly
 35 40 45

Arg Ser Ile Lys Glu Met Leu Gly Gly Arg Lys Gln Gly Asp Asp Pro
 50 55 60
 His Gly Ile Thr Pro Phe Gln Ala Phe Val Thr Gly Leu Ala Ser Arg
 65 70 75 80
 Val Gly Val Gly Asn Ile Ala Gly Val Ala Ile Ala Ile Lys Val Gly
 85 90 95
 Gly Pro Gly Ala Val Phe Trp Met Trp Val Thr Ala Leu Ile Gly Met
 100 105 110
 Ser Ser Ala Phe Val Glu Ser Ser Leu Ala Gln Leu Phe Lys Val Arg
 115 120 125
 Asp Tyr Asp Asn His His Phe Arg Gly Gly Pro Ala Tyr Tyr Ile Thr
 130 135 140
 Gln Gly Leu Gly Gln Lys Trp Leu Gly Val Leu Phe Ala Leu Ser Leu
 145 150 155 160
 Ile Phe Cys Phe Gly Phe Val Phe Glu Ala Val Gln Thr Asn Thr Ile
 165 170 175
 Ala Asp Thr Val Lys Ala Ala Trp Gly Trp Glu Pro His Tyr Val Gly
 180 185 190
 Val Ala Leu Val Ile Leu Thr Ala Pro Ile Ile Phe Gly Gly Ile Arg
 195 200 205
 Arg Ile Ser Lys Ala Ala Glu Ile Val Val Pro Leu Met Ala Val Leu
 210 215 220
 Tyr Leu Phe Ile Ala Leu Phe Ile Ile Leu Thr Asn Ile Pro Met Ile
 225 230 235 240
 Pro Asp Val Phe Gly Gln Ile Phe Ser Gly Ala Phe Lys Phe Asp Ala
 245 250 255
 Ala Ala Gly Gly Leu Leu Gly Gly Leu Ile Ser Gln Thr Met Met Met
 260 265 270
 Gly Ile Lys Arg Gly Leu Tyr Ser Asn Glu Ala Gly Met Gly Ser Ala
 275 280 285
 Pro Asn Ala Ala Ala Ala Glu Val Lys His Pro Val Ser Gln Gly
 290 295 300
 Met Ile Gln Met Leu Gly Val Phe Val Asp Thr Ile Ile Val Cys Ser
 305 310 315 320
 Cys Thr Ala Phe Ile Ile Leu Ile Tyr Gln Gln Pro Tyr Gly Asp Leu
 325 330 335
 Ser Gly Ala Ala Leu Thr Gln Ala Ala Ile Val Ser Gln Val Gly Gln
 340 345 350

Trp Gly Ala Gly Phe Leu Ala Val Ile Leu Phe Met Phe Ala Phe Ser

355

360

365

Thr Val Ile Gly Asn Tyr Ala Tyr Ala Glu Ser Asn Val Gln Phe Ile
370 375 380

Lys Ser His Trp Leu Ile Thr Ala Val Phe Arg Met Leu Val Leu Ala
385 390 395 400

Trp Val Tyr Phe Gly Ala Val Ala Asn Val Pro Leu Val Trp Asp Met
405 410 415

Ala Asp Met Ala Met Gly Ile Met Ala Trp Ile Asn Leu Val Ala Ile
420 425 430

Leu Leu Leu Ser Pro Leu Ala Phe Met Leu Leu Arg Asp Tyr Thr Ala
435 440 445

Lys Leu Lys Met Gly Lys Asp Pro Glu Phe Lys Leu Ser Glu His Pro
450 455 460

Gly Leu Lys Arg Arg Ile Lys Ser Asp Val Trp
465 470 475

<210> 1417

<211> 1080

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1417

atggttcaaa tacaggttgt gcgcgccgcc ggcgttgccc gtggtctgca ttccgagttt 60
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cggcgcggtg gcaacacctt ccgcatacaa atagctgctg cggaaagagc gggggatgtg 180
cggttcttcg cgcaggttga ggaaatcggg caggactttt ttgccgatgc tgcgatcag 240
gaaactgctt tggcggtaga gcgcgccgcc ggagagtgtg ccgacgaggt gtccgatcag 300
cccgccgaa acggtggtat cgaagaggac ggggtagctg cctgtcggga tgctgcggct 360
gccgagtcg cgcacagtc gccgggcggc ggtttgaccg atggtttcgg ggctgtccat 420
atccgatgg cggcaggcgg aatcgtacca gtagtcgcgc tgcattccgt tttcgtcggc 480
ggcgacgacg ctgcaggaaa tgctgtggtg cgtgctttgc cgggtgtcgg caaaaccgtg 540
ggtgttgccg taaacgtatt ggtactgtcc ggtttgcacc gccgcgcctt cggagttttc 600
gatgcggctg tccgtgtcca acgctgcctg ttcgcattgt tttgccaagc cgacggcggc 660
ttccgtatcc aaatcccatt cgtggtaaaag gtcggggtcg ccgatgtgtt gcgccatcaa 720
ctcggggtcg gcaagtccgg cgcaaccgtc ttcggcgggtg tggcgggcga tgctcggcggc 780
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gatttcgccc aagcgcacgc tgacgctttg tccgagcgat tcgctgaagt cggcttcggc 960
ggcgttcgcg ccgctgtctt ttgccaagtc gacggtgcgg cggcagaggt cgaggagttc 1020
ggaagcgggtg tggttgaaca gcataacaat ctttcttggt ggagcgttgt ggcattttta 1080

<210> 1418

<211> 359

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1418

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Val | Gln | Ile | Gln | Val | Val | Arg | Ala | Ala | Gly | Val | Ala | Arg | Gly | Leu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| His | Ser | Glu | Phe | Ala | Arg | Ala | Val | Thr | Ala | Glu | Glu | Ile | Ala | Phe | Asp |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Asn | Ala | Val | Leu | Asn | His | Glu | Ala | Arg | Arg | Gly | Gly | Asn | Thr | Phe | Arg |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Ile | Lys | Ile | Ala | Ala | Ala | Glu | Arg | Ala | Gly | Asp | Val | Arg | Phe | Phe | Ala |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Gln | Val | Glu | Glu | Ile | Gly | Gln | Asp | Phe | Phe | Ala | Asp | Ala | Val | Asp | Gln |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Glu | Thr | Ala | Leu | Ala | Val | Glu | Arg | Ala | Ala | Gly | Glu | Cys | Ala | Asp | Glu |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Val | Ser | Asp | Gln | Pro | Ala | Arg | Asn | Gly | Gly | Ile | Glu | Glu | Asp | Gly | Val |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Ala | Ala | Cys | Arg | Asp | Ala | Ala | Ala | Ala | Glu | Ser | Ala | Gln | Ser | Ala | Ala |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Gly | Gly | Gly | Leu | Thr | Asp | Gly | Phe | Gly | Ala | Val | His | Ile | Arg | Met | Ala |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Ala | Gly | Gly | Ile | Val | Pro | Val | Val | Ala | Leu | His | Ser | Val | Phe | Val | Gly |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Gly | Asp | Asp | Ala | Ala | Gly | Asn | Ala | Val | Val | Arg | Ala | Leu | Pro | Val | Cys |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Gly | Lys | Thr | Val | Gly | Val | Ala | Val | Asn | Val | Leu | Val | Leu | Ser | Gly | Leu |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| His | Arg | Arg | Ala | Phe | Gly | Val | Phe | Asp | Ala | Ala | Val | Arg | Val | Gln | Arg |
| | | | 195 | | | | 200 | | | | | 205 | | | |
| Cys | Leu | Phe | Ala | Leu | Phe | Cys | Gln | Ala | Asp | Gly | Gly | Phe | Arg | Ile | Gln |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Ile | Pro | Phe | Val | Val | Lys | Val | Gly | Val | Ala | Asp | Val | Leu | Arg | His | Gln |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Leu | Gly | Val | Gly | Lys | Ser | Gly | Ala | Thr | Val | Phe | Gly | Gly | Val | Ala | Gly |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Asp | Val | Gly | Gly | Gly | Ala | Asp | Gly | Val | Ala | Gln | Gly | Leu | Phe | Gly | Glu |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Val | Gly | Gly | Ala | Gly | Ala | Ala | Phe | Ala | Phe | Ala | Asp | Val | Asn | Gly | Asn |
| | | 275 | | | | | 280 | | | | | | 285 | | |
| Val | Gln | Arg | Phe | Val | Leu | Leu | Glu | Leu | Asp | Leu | Phe | Asp | Phe | Ala | Gln |

290

295

300

Ala His Ala Asp Ala Leu Ser Glu Arg Phe Ala Glu Val Gly Phe Gly
305 310 315 320

Gly Gly Arg Ala Arg Cys Phe Cys Gln Val Glu Arg Ala Ala Ala Glu
325 330 335

Val Glu Glu Phe Gly Ser Gly Val Val Glu Gln His Asn Asn Leu Ser
340 345 350

Trp Trp Ser Val Val Ala Phe
355

<210> 1419

<211> 918

<212> DNA

<213> *Neisseria meningitidis*

<400> 1419

```

ggaaagagcg ggggatgtgc gttcttcgcg caggttgagg aaatcgggca ggacttttct 60
gccgatgctg tcgatcagga aactgctttg gcggttagagc gcgccgccgg agagtgcgcc 120
gacgaggtgt ccgataagac cgcccgaac ggtggtatcg aagaggacgg ggtagctgcc 180
tgtcgggatg ctgcggctgc cgagtcggcg caaagtgcgg cgggcggcgg tttgaccgat 240
ggtttcgggg ctgtccatat ccgatggcg gcaggcggaa tcgtaccagt agtcgcgctg 300
catgccgttt tcgtcggcgg caacgacgct gcaggaaatg ctgtggtgcg tgccttgccg 360
gtgtgcggca aaaccgtggg tgttgccgta aacgtattgg taatggccgg tttgcaccgc 420
cgcgcccttcg gaggtttcca tgcgctcatc ctcgttcagg gcggcttggt cgcattggtt 480
tgccaagccg acggcgggctk ccgtatccaa atcccattcg tggtaaaggc cggggtcgcc 540
gatgtgtttt gccatcagac aggcacggc aagtcggcgg caaccgtctt cggcgggtg 600
gcgggcgatg tcgatggcgg ctttgacggg gtcttgacag gctttttcgg agaagtcggc 660
agtactggcg cggcctttgc gtttgccgac gtaaacggta atgtccagcg acttgctctg 720
ctggaactcg atttgttsga tttsgcccag ccgcacgctg acgctttgtc ccaatgattc 780
gctgaaatcg gcttcggcgg cggttgcgcc cgtcgctttt gccaaagtcg gcgtgcggcg 840
gcagaggtcg aggagttcgg aagcgggtgtg gttgaacagc atagaaatct ttcttgatga 900
tgctttgcgg cattttaa 918

```

<210> 1420

<211> 305

<212> PRT

<213> *Neisseria meningitidis*

<400> 1420

Gly Lys Ser Gly Gly Cys Ala Phe Phe Ala Gln Val Glu Glu Ile Gly
1 5 10 15

Gln Asp Phe Ser Ala Asp Ala Val Asp Gln Glu Thr Ala Leu Ala Val
20 25 30

Glu Arg Ala Ala Gly Glu Cys Ala Asp Glu Val Ser Asp Lys Thr Ala
35 40 45

Arg Asn Gly Gly Ile Glu Glu Asp Gly Val Ala Ala Cys Arg Asp Ala
50 55 60

Ala Ala Ala Glu Ser Ala Gln Ser Ala Ala Gly Gly Gly Leu Thr Asp
 65 70 75 80
 Gly Phe Gly Ala Val His Ile Arg Met Ala Ala Gly Gly Ile Val Pro
 85 90 95
 Val Val Ala Leu His Ala Val Phe Val Gly Gly Asn Asp Ala Ala Gly
 100 105 110
 Asn Ala Val Val Arg Ala Leu Pro Val Cys Gly Lys Thr Val Gly Val
 115 120 125
 Ala Val Asn Val Leu Val Met Ala Gly Leu His Arg Arg Ala Phe Gly
 130 135 140
 Val Phe Asp Ala Leu Ile Leu Val Gln Gly Gly Leu Phe Ala Leu Phe
 145 150 155 160
 Cys Gln Ala Asp Gly Gly Xaa Arg Ile Gln Ile Pro Phe Val Val Lys
 165 170 175
 Val Gly Val Ala Asp Val Phe Cys His Gln Thr Gly Ile Gly Lys Ser
 180 185 190
 Gly Ala Thr Val Phe Gly Gly Val Ala Gly Asp Val Asp Gly Gly Phe
 195 200 205
 Asp Gly Val Leu Gln Gly Phe Phe Gly Glu Val Gly Ser Thr Gly Ala
 210 215 220
 Ala Phe Ala Phe Ala Asp Val Asn Gly Asn Val Gln Arg Leu Val Leu
 225 230 235 240
 Leu Glu Leu Asp Leu Xaa Asp Xaa Ala Gln Pro His Ala Asp Ala Leu
 245 250 255
 Ser Gln Xaa Phe Ala Glu Ile Gly Phe Gly Gly Gly Cys Ala Arg Arg
 260 265 270
 Phe Cys Gln Val Glu Arg Ala Ala Ala Glu Val Glu Glu Phe Gly Ser
 275 280 285
 Gly Val Val Glu Gln His Arg Asn Leu Ser Xaa Xaa Cys Phe Ala Ala
 290 295 300
 Phe
 305

<210> 1421

<211> 1080

<212> DNA

<213> *Neisseria meningitidis*

<400> 1421

atggttcaaa taaagttgt gcgcgccgcc ggcgttgccc gtggtctgca ttccgagttt 60
 gcgcgcgctg taactgctga ggaaatagcc ttcgacaatg ccgttttgaa tcacgaagcg 120

```

cgggtgcggtg gcaacgcctt ccgcatcaaa atagctgctg cggaaagagc ggggggatgtg 180
cggttcttcg cgcaggttga ggaaatcggg caggactttt ttgccgatgc tgtcgatcag 240
gaaactgctt tggcggtaga gcgctccgcc ggagagtgcg ccgacgaggt gtccgataag 300
accgcccga aacgggtgat cgaagaggac ggggtagttg cctgtcgga tgctgcggct 360
gccgagtcgg cgcaaagtgc ggcgggcggc ggtttgaccg atggtttcgg ggctgtccat 420
atccggatgg cggcaggcgg aatcgtacca gtagtcgcgc tgcattgccg ttctgtcggc 480
ggcaacgacg ctgcaggaaa tgctgtggtg cgtgctttgc cgggtgtcgg caaaaccgta 540
ggtgttgccg taaacgtatt ggtaatggcc ggtttgacc gccgcgcctt cggagttttc 600
gatgcgctca tctcgttca gggcggttg ttgcattgt tttgccaagc cgacggcggc 660
ttccgtatcc aaatcccatt cgtggtaaa gtcggggtcg ccgatgtgtt gcgccatcaa 720
ctcggggtcg gcaagtccgg cgcaaccgtc ttcggcggtg tggcgggcga tgcnnnnngc 780
ggcgcggaag gtgtcgcgca gggcttggtc ggagaaatcg gcggtgccgg cgcggccttt 840
gcgtttgccg acgtaaacgg taatgtccag cgacttgctc tgctgaaact cgatttggtc 900
gatttcgccc agccgcacgc tgacgctttg tcccaatgat tcgctgaaat cggcttcggc 960
ggcggttgcg cccgtcgctt ttgccaagtc gagcgtgcgg cggcagaggt cgaggagttc 1020
ggaagcgggtg tggttgaaca gcatagaaat ctttcttgat gatgctttgc ggcattttaa 1080

```

<210> 1422

<211> 356

<212> PRT

<213> Neisseria meningitidis

<400> 1422

```

Met Val Gln Ile Lys Val Val Arg Ala Ala Gly Val Ala Arg Gly Leu
  1             5             10             15

```

```

His Ser Glu Phe Ala Arg Ala Val Thr Ala Glu Glu Ile Ala Phe Asp
      20             25             30

```

```

Asn Ala Val Leu Asn His Glu Ala Arg Cys Gly Gly Asn Ala Phe Arg
    35             40             45

```

```

Ile Lys Ile Ala Ala Ala Glu Arg Ala Gly Asp Val Arg Phe Phe Ala
    50             55             60

```

```

Gln Val Glu Glu Ile Gly Gln Asp Phe Phe Ala Asp Ala Val Asp Gln
    65             70             75             80

```

```

Glu Thr Ala Leu Ala Val Glu Arg Ser Ala Gly Glu Cys Ala Asp Glu
      85             90             95

```

```

Val Ser Asp Lys Thr Ala Arg Asn Gly Gly Ile Glu Glu Asp Gly Val
   100             105             110

```

```

Val Ala Cys Arg Asp Ala Ala Ala Ala Glu Ser Ala Gln Ser Ala Ala
   115             120             125

```

```

Gly Gly Gly Leu Thr Asp Gly Phe Gly Ala Val His Ile Arg Met Ala
   130             135             140

```

```

Ala Gly Gly Ile Val Pro Val Val Ala Leu His Ala Val Phe Val Gly
   145             150             155             160

```

```

Gly Asn Asp Ala Ala Gly Asn Ala Val Val Arg Ala Leu Pro Val Cys
   165             170             175

```


Gly Lys Thr Val Gly Val Ala Val Asn Val Leu Val Met Ala Gly Leu
 180 185 190
 His Arg Arg Ala Phe Gly Val Phe Asp Ala Leu Ile Leu Val Gln Gly
 195 200 205
 Gly Leu Phe Ala Leu Phe Cys Gln Ala Asp Gly Gly Phe Arg Ile Gln
 210 215 220
 Ile Pro Phe Val Val Lys Val Gly Val Ala Asp Val Leu Arg His Gln
 225 230 235 240
 Leu Gly Val Gly Lys Ser Gly Ala Thr Val Phe Gly Gly Val Ala Gly
 245 250 255
 Asp Val Xaa Xaa Gly Ala Asp Gly Val Ala Gln Gly Leu Phe Gly Glu
 260 265 270
 Ile Gly Gly Ala Gly Ala Ala Phe Ala Phe Ala Asp Val Asn Gly Asn
 275 280 285
 Val Gln Arg Leu Val Leu Leu Lys Leu Asp Leu Phe Asp Phe Ala Gln
 290 295 300
 Pro His Ala Asp Ala Leu Ser Gln Phe Ala Glu Ile Gly Phe Gly Gly
 305 310 315 320
 Gly Cys Ala Arg Arg Phe Cys Gln Val Glu Arg Ala Ala Ala Glu Val
 325 330 335
 Glu Glu Phe Gly Ser Gly Val Val Glu Gln His Arg Asn Leu Ser Cys
 340 345 350
 Phe Ala Ala Phe
 355

<210> 1423
 <211> 1080
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1423
 atggttcaaa tacaggttgt gcgcgccgcc ggcgttgccc gtggtctgca ttccgagttt 60
 gcgcgcgctg taactgccga ggaaatagcc ttcgacaatg ccgttttgaa tcacgaagcg 120
 cggcgcggtg gcaacacctt ccgcatcaaa atagctgctg cggaaagagc gggggatgtg 180
 cggttcttcg cgcaggttga ggaaatcggg caggactttt ttgccgatgc tgcgatcag 240
 gaaactgctt tggcggtaga gcgcgccgcg ggagagtgtg ccgacgaggt gtccgatcag 300
 cccgcccgaa acggtggtat cgaagaggac ggggtagctg cctgtcggga tgctgcggct 360
 gccgagtcgg cgcaaagtgc ggccggcgcc ggtttgaccg atggtttcgg ggctgtccat 420
 atccggatgg cggcaggcgg aatcgtacca gtatgcgcgc tgcattccgt tttcgtcggc 480
 ggcaacgacg ctgcaggaaa tgctgtggtg cgtgctttgc cgggtgtcgg caaaaccgtg 540
 ggtgttgccg taaacgtatt ggtagtgtcc ggtttgcacc gccgcgcctt cggagttttc 600
 gatgcggctg tccgtgtcca acgctgcctg ttcgcattgt tttgccaagc cgacggcgcc 660
 ttccgtatcc aaatcccatt cgtggtaaaag gtcggggctg ccgatgtgtt gcgccatcaa 720
 ctccggggtc gcaagtccgg cgcaaccgtc ttcggcggtg tggcgggcga tgcggcgcc 780
 ggcgcggacg gtgtcgcgca ggccttggtc ggagaagtgc gcggtgccgg ccgggccttt 840

gcgtttgccc acgtaaaccg taatgtccag cgatttgtcc tgctggaact cgatttgttc 900
gatttcgccc aagcgcacgc tgacgctttg tccgagcgat tcgctgaagt cggcttcggc 960
ggcggtcgcg cccgctgctt ttgccaagtc gagcgtgcgg cggcagaggt cgaggagttc 1020
ggaagcggtg tggttgaaca gcataacaat ctttcttggt ggagcgttgt ggcattttaa 1080

<210> 1424

<211> 359

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1424

Met Val Gln Ile Gln Val Val Arg Ala Ala Gly Val Ala Arg Gly Leu
1 5 10 15

His Ser Glu Phe Ala Arg Ala Val Thr Ala Glu Glu Ile Ala Phe Asp
20 25 30

Asn Ala Val Leu Asn His Glu Ala Arg Arg Gly Gly Asn Thr Phe Arg
35 40 45

Ile Lys Ile Ala Ala Ala Glu Arg Ala Gly Asp Val Arg Phe Phe Ala
50 55 60

Gln Val Glu Glu Ile Gly Gln Asp Phe Phe Ala Asp Ala Val Asp Gln
65 70 75 80

Glu Thr Ala Leu Ala Val Glu Arg Ala Ala Gly Glu Cys Ala Asp Glu
85 90 95

Val Ser Asp Gln Pro Ala Arg Asn Gly Gly Ile Glu Glu Asp Gly Val
100 105 110

Ala Ala Cys Arg Asp Ala Ala Ala Ala Glu Ser Ala Gln Ser Ala Ala
115 120 125

Gly Gly Gly Leu Thr Asp Gly Phe Gly Ala Val His Ile Arg Met Ala
130 135 140

Ala Gly Gly Ile Val Pro Val Val Ala Leu His Ser Val Phe Val Gly
145 150 155 160

Gly Asn Asp Ala Ala Gly Asn Ala Val Val Arg Ala Leu Pro Val Cys
165 170 175

Gly Lys Thr Val Gly Val Ala Val Asn Val Leu Val Val Ser Gly Leu
180 185 190

His Arg Arg Ala Phe Gly Val Phe Asp Ala Ala Val Arg Val Gln Arg
195 200 205

Cys Leu Phe Ala Leu Phe Cys Gln Ala Asp Gly Gly Phe Arg Ile Gln
210 215 220

Ile Pro Phe Val Val Lys Val Gly Val Ala Asp Val Leu Arg His Gln
225 230 235 240

Leu Gly Val Gly Lys Ser Gly Ala Thr Val Phe Gly Gly Val Ala Gly
 245 250 255
 Asp Val Gly Gly Gly Ala Asp Gly Val Ala Gln Gly Leu Phe Gly Glu
 260 265 270
 Val Gly Gly Ala Gly Ala Ala Phe Ala Phe Ala Asp Val Asn Gly Asn
 275 280 285
 Val Gln Arg Phe Val Leu Leu Glu Leu Asp Leu Phe Asp Phe Ala Gln
 290 295 300
 Ala His Ala Asp Ala Leu Ser Glu Arg Phe Ala Glu Val Gly Phe Gly
 305 310 315 320
 Gly Gly Arg Ala Arg Cys Phe Cys Gln Val Glu Arg Ala Ala Ala Glu
 325 330 335
 Val Glu Glu Phe Gly Ser Gly Val Val Glu Gln His Asn Asn Leu Ser
 340 345 350
 Trp Trp Ser Val Val Ala Phe
 355

<210> 1425
 <211> 939
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1425
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 gcgcgcgctg taactgctga ggaaatagcc ttcgacaatg ccgttttgaa tcacgaagcg 120
 cgggtgcggtg gcaacgcctt ccgcatcaaa atagctgctg cggaagagc gggggatgtg 180
 cggttcttcg cgcaggttga ggaaatcggg caggactttt ttgccgatgc tgcgatcag 240
 gaaactgctt tggcggtaga gcgcgccgcc ggagagtgcg ccgacgaggt gtccgataag 300
 accgcccga aacggtggtat cgaagaggac ggggtagctg cctgtcggga tgctgcggt 360
 gccgagtcg cgcaaagtgc ggcgggcggc ggtttgaccg atggtttcgg ggctgtccat 420
 atccgatgg cggcaggcgg aatcgtacca gtatgcgcgc tgcattgccg ttctgtcggc 480
 ggcaacgacg ctgcaggaaa tgctgtggtg cgtgccttgc cgggtgtcgg caaaaccgtg 540
 ggtgttgccg taaacgtatt ggtaatggcc ggtttgcacc gccgcgcctt cggagttttc 600
 gatgcgctca tcctcgttca ggcggcgttg ttcgcattgt tttgccaagc cgacggcggc 660
 ttccgtatcc aaatcccatt cgtggttaaag gtcggggtcg ccgatgtgtt ttgccatcag 720
 acaggcatcg gcaagtccgg cgcaaccgtc ttcggcggtg tggcgggcga tgcgatggc 780
 ggctttgacg gtgtcttgca ggcctttttc ggagaagtcg gcagtactgg cgcggccttt 840
 gcgtttgccg acgtaaaccg taatgtccag cgacttgtcc tgctggaact cgatttgttc 900
 gatttcgccc agccgcacgc tgacgcttg tcccaatga 939

<210> 1426
 <211> 312
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1426
 Met Val Gln Ile Gln Val Val Arg Ala Ala Gly Val Ala Arg Gly Leu

| 1 | 5 | 10 | 15 |
|---|-----|-----|-----|
| His Thr Glu Phe Ala Arg Ala Val Thr Ala Glu Glu Ile Ala Phe Asp | 20 | 25 | 30 |
| Asn Ala Val Leu Asn His Glu Ala Arg Cys Gly Gly Asn Ala Phe Arg | 35 | 40 | 45 |
| Ile Lys Ile Ala Ala Ala Glu Arg Ala Gly Asp Val Arg Phe Phe Ala | 50 | 55 | 60 |
| Gln Val Glu Glu Ile Gly Gln Asp Phe Phe Ala Asp Ala Val Asp Gln | 65 | 70 | 75 |
| Glu Thr Ala Leu Ala Val Glu Arg Ala Ala Gly Glu Cys Ala Asp Glu | 85 | 90 | 95 |
| Val Ser Asp Lys Thr Ala Arg Asn Gly Gly Ile Glu Glu Asp Gly Val | 100 | 105 | 110 |
| Ala Ala Cys Arg Asp Ala Ala Ala Ala Glu Ser Ala Gln Ser Ala Ala | 115 | 120 | 125 |
| Gly Gly Gly Leu Thr Asp Gly Phe Gly Ala Val His Ile Arg Met Ala | 130 | 135 | 140 |
| Ala Gly Gly Ile Val Pro Val Val Ala Leu His Ala Val Phe Val Gly | 145 | 150 | 155 |
| Gly Asn Asp Ala Ala Gly Asn Ala Val Val Arg Ala Leu Pro Val Cys | 165 | 170 | 175 |
| Gly Lys Thr Val Gly Val Ala Val Asn Val Leu Val Met Ala Gly Leu | 180 | 185 | 190 |
| His Arg Arg Ala Phe Gly Val Phe Asp Ala Leu Ile Leu Val Gln Gly | 195 | 200 | 205 |
| Gly Leu Phe Ala Leu Phe Cys Gln Ala Asp Gly Gly Phe Arg Ile Gln | 210 | 215 | 220 |
| Ile Pro Phe Val Val Lys Val Gly Val Ala Asp Val Phe Cys His Gln | 225 | 230 | 235 |
| Thr Gly Ile Gly Lys Ser Gly Ala Thr Val Phe Gly Gly Val Ala Gly | 245 | 250 | 255 |
| Asp Val Asp Gly Gly Phe Asp Gly Val Leu Gln Gly Phe Phe Gly Glu | 260 | 265 | 270 |
| Val Gly Ser Thr Gly Ala Ala Phe Ala Phe Ala Asp Val Asn Gly Asn | 275 | 280 | 285 |
| Val Gln Arg Leu Val Leu Leu Glu Leu Asp Leu Phe Asp Phe Ala Gln | 290 | 295 | 300 |

Pro His Ala Asp Ala Leu Ser Gln
305 310

<210> 1427
<211> 939
<212> DNA
<213> Neisseria meningitidis

<400> 1427
atggttcaaa taaagggttgt gcgcgcgcgcc ggcgttgccc gtggtctgca ttccgagttt 60
gcgcgcgcgtg taactgctga ggaaatagcc ttcgacaatg ccgttttgaa tcacgaagcg 120
cgggtgcggtg gcaacgcctt ccgcatcaaa atagctgctg cggaaagagc gggggatgtg 180
cggttcttcg cgcaggttga ggaaatcggg caggactttt ttgccgatgc tgtcgatcag 240
gaaactgctt tggcggtaga gcgctccgcc ggagagtgcg ccgacgaggt gtccgataag 300
accgcccga aacggtggtat cgaagaggac ggggtagttg cctgtcggga tgctgcggct 360
gccgagtcgg cgcaaagtgc ggcgggcggc gggttgaccg atggtttcgg ggctgtccat 420
atccggatgg cggcaggcgg aatcgtaacca gtatgcgcgc tgcattgccg tttcgtcggc 480
ggcaacgacg ctgcaggaaa tgctgtggtg cgtgctttgc cgggtgtcgg caaaaccgta 540
gggtgttgccg taaacgtatt ggtaatggcc gggttgaccg gccgcgcctt cggagttttc 600
gatgcgctca tcctcgttca ggcgcgcttg ttcgcattgt ttgccaagc cgacggcggc 660
ttccgtatcc aaatccatt cgtggtaaag gtcggggtcg ccgatgtgtt gcgccatcaa 720
ctcggggtcg gcaagtccgg cgcaaccgtc ttcggcgggtg tggcgggcga tgtcggcggc 780
ggcgcggacg gtgtcgcgca gggcttggtc ggagaaatcg gcggtgccgg cgcggccttt 840
gcgtttgccg acgtaaacgg taatgtccag cgacttgctc tgctgaaact cgatttggtc 900
gatttcgccc agccgcacgc tgacgctttg tcccaatga 939

<210> 1428
<211> 312
<212> PRT

<213> Neisseria meningitidis

<400> 1428
Met Val Gln Ile Lys Val Val Arg Ala Ala Gly Val Ala Arg Gly Leu
1 5 10 15
His Ser Glu Phe Ala Arg Ala Val Thr Ala Glu Glu Ile Ala Phe Asp
20 25 30
Asn Ala Val Leu Asn His Glu Ala Arg Cys Gly Gly Asn Ala Phe Arg
35 40 45
Ile Lys Ile Ala Ala Ala Glu Arg Ala Gly Asp Val Arg Phe Phe Ala
50 55 60
Gln Val Glu Glu Ile Gly Gln Asp Phe Phe Ala Asp Ala Val Asp Gln
65 70 75 80
Glu Thr Ala Leu Ala Val Glu Arg Ser Ala Gly Glu Cys Ala Asp Glu
85 90 95
Val Ser Asp Lys Thr Ala Arg Asn Gly Gly Ile Glu Glu Asp Gly Val
100 105 110
Val Ala Cys Arg Asp Ala Ala Ala Ala Glu Ser Ala Gln Ser Ala Ala

| 115 | | | | | 120 | | | | | 125 | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Gly | Gly | Leu | Thr | Asp | Gly | Phe | Gly | Ala | Val | His | Ile | Arg | Met | Ala |
| 130 | | | | | | 135 | | | | | 140 | | | | |
| Ala | Gly | Gly | Ile | Val | Pro | Val | Val | Ala | Leu | His | Ala | Val | Phe | Val | Gly |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Gly | Asn | Asp | Ala | Ala | Gly | Asn | Ala | Val | Val | Arg | Ala | Leu | Pro | Val | Cys |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Gly | Lys | Thr | Val | Gly | Val | Ala | Val | Asn | Val | Leu | Val | Met | Ala | Gly | Leu |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| His | Arg | Arg | Ala | Phe | Gly | Val | Phe | Asp | Ala | Leu | Ile | Leu | Val | Gln | Gly |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Gly | Leu | Phe | Ala | Leu | Phe | Cys | Gln | Ala | Asp | Gly | Gly | Phe | Arg | Ile | Gln |
| 210 | | | | | | 215 | | | | | 220 | | | | |
| Ile | Pro | Phe | Val | Val | Lys | Val | Gly | Val | Ala | Asp | Val | Leu | Arg | His | Gln |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Leu | Gly | Val | Gly | Lys | Ser | Gly | Ala | Thr | Val | Phe | Gly | Gly | Val | Ala | Gly |
| | | | 245 | | | | | | 250 | | | | | 255 | |
| Asp | Val | Gly | Gly | Gly | Ala | Asp | Gly | Val | Ala | Gln | Gly | Leu | Phe | Gly | Glu |
| | | 260 | | | | | | 265 | | | | | 270 | | |
| Ile | Gly | Gly | Ala | Gly | Ala | Ala | Phe | Ala | Phe | Ala | Asp | Val | Asn | Gly | Asn |
| | 275 | | | | | | 280 | | | | | 285 | | | |
| Val | Gln | Arg | Leu | Val | Leu | Leu | Lys | Leu | Asp | Leu | Phe | Asp | Phe | Ala | Gln |
| 290 | | | | | 295 | | | | | | 300 | | | | |
| Pro | His | Ala | Asp | Ala | Leu | Ser | Gln | | | | | | | | |
| 305 | | | | | 310 | | | | | | | | | | |

<210> 1429

<211> 714

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1429

```

atgttggtcc gtaaaacgac cgccgccgtt ttggcggcaa ccttgatact gaacggctgt 60
acgatgatgt tgcgggggat gaacaaccgg gtcagccaaa caatcaccgg caaacacgtt 120
gacaaagacc aaatccgcgc cttcgggtgtg gttgccgaag acaatgccca attggaaaag 180
ggcagcctgg tgatgatggg cgggaaatac tggttcgcgg tcaatccgga agattcggcg 240
aagctgacgg gccttttgaa ggccgggttg gacaagccct tccaaatagt tgaggatacc 300
ccgagctatg cccgccacca agccttgccg gtcaaattcg aagcgcccgg cagccagaat 360
ttcagtaccg gaggtctttg cctgcgctat gataccggca gacctgacga catcgccaag 420
ctgaaacagc ttgagtttaa agcgggtcaaa ctcgacaatc ggaccattta cacgcgctgc 480
gtatccgcca aaggcaaata ctacgccacg ccgcaaaaac tgaacgccga ttatcatttt 540
gagcaaagtg tgcccgcgga tatttattat acggttactg aaaaacatac cgacaaatcc 600
aagctgtttg gaaatatott atatacgccc cccttggtga tattggatgc ggcggccggc 660
gtgctggtct tgcctatggc tctgattgca gccgcgaatt cctcagacaa atga 714

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<210> 1430
<211> 237
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1430
Met Leu Phe Arg Lys Thr Thr Ala Ala Val Leu Ala Ala Thr Leu Ile
1 5 10 15
Leu Asn Gly Cys Thr Met Met Leu Arg Gly Met Asn Asn Pro Val Ser
20 25 30
Gln Thr Ile Thr Arg Lys His Val Asp Lys Asp Gln Ile Arg Ala Phe
35 40 45
Gly Val Val Ala Glu Asp Asn Ala Gln Leu Glu Lys Gly Ser Leu Val
50 55 60
Met Met Gly Gly Lys Tyr Trp Phe Ala Val Asn Pro Glu Asp Ser Ala
65 70 75 80
Lys Leu Thr Gly Leu Leu Lys Ala Gly Leu Asp Lys Pro Phe Gln Ile
85 90 95
Val Glu Asp Thr Pro Ser Tyr Ala Arg His Gln Ala Leu Pro Val Lys
100 105 110
Phe Glu Ala Pro Gly Ser Gln Asn Phe Ser Thr Gly Gly Leu Cys Leu
115 120 125
Arg Tyr Asp Thr Gly Arg Pro Asp Asp Ile Ala Lys Leu Lys Gln Leu
130 135 140
Glu Phe Lys Ala Val Lys Leu Asp Asn Arg Thr Ile Tyr Thr Arg Cys
145 150 155 160
Val Ser Ala Lys Gly Lys Tyr Tyr Ala Thr Pro Gln Lys Leu Asn Ala
165 170 175
Asp Tyr His Phe Glu Gln Ser Val Pro Ala Asp Ile Tyr Tyr Thr Val
180 185 190
Thr Glu Lys His Thr Asp Lys Ser Lys Leu Phe Gly Asn Ile Leu Tyr
195 200 205
Thr Pro Pro Leu Leu Ile Leu Asp Ala Ala Ala Ala Val Leu Val Leu
210 215 220
Pro Met Ala Leu Ile Ala Ala Ala Asn Ser Ser Asp Lys
225 230 235

<210> 1431
<211> 717
<212> DNA

<213> Neisseria meningitidis

<400> 1431

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atgttggtcc gtaaaacgac cgccgccgtt ttggcggcaa ccttgatgct gaacggctgt 60
acgttgatgt tgtggggaat gaacaacccg gtcagcgaaa caatcacccg caaacacgtt 120
gacaaagacc aaatccgcgc cttcgggtgtg gttgccgaag acaatgccc aattggaaaag 180
ggcagcctgg tgatgatggg cggaataac tggttcgctg tcaatcccga agattcggcg 240
aagctgacgg gcattttgaa ggcagggctg gacaaaccct tccaaatagt tgaggatacc 300
ccgagctatg ctgcgccacca agccctgccg gtcaaaactg aatcgccctg cagccagaat 360
ttcagtaccg aaggcctttg cctgcgctac gataccgaca agcctgccga catcgccaag 420
ctgaaacagc tcgggtttga agcgggtcaaa ctcgacaatc ggaccattta cacgcgctgc 480
gtatccgcca aaggcaaata ctacgccaca ccgcaaaaac tgaacgccga ttaccatttt 540
gagcaaagtg tgcctgccga tatttattac acggttactg aagaacatac cgacaaatcc 600
aagctgtttg caaatatctt atatacgccc ccctttttga tactggatgc ggcgggcgcg 660
gtactggcct tgcctgcggc ggctctgggt gcggtcgtgg atgcgcgccg caaatga 717
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<210> 1432

<211> 238

<212> PRT

<213> Neisseria meningitidis

<400> 1432

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Met Leu Phe Arg Lys Thr Thr Ala Ala Val Leu Ala Ala Thr Leu Met
  1                      5                      10                      15

Leu Asn Gly Cys Thr Leu Met Leu Trp Gly Met Asn Asn Pro Val Ser
                20                      25                      30

Glu Thr Ile Thr Arg Lys His Val Asp Lys Asp Gln Ile Arg Ala Phe
    35                      40                      45

Gly Val Val Ala Glu Asp Asn Ala Gln Leu Glu Lys Gly Ser Leu Val
    50                      55                      60

Met Met Gly Gly Lys Tyr Trp Phe Val Val Asn Pro Glu Asp Ser Ala
    65                      70                      75                      80

Lys Leu Thr Gly Ile Leu Lys Ala Gly Leu Asp Lys Pro Phe Gln Ile
                85                      90                      95

Val Glu Asp Thr Pro Ser Tyr Ala Arg His Gln Ala Leu Pro Val Lys
    100                      105                      110

Leu Glu Ser Pro Gly Ser Gln Asn Phe Ser Thr Glu Gly Leu Cys Leu
    115                      120                      125

Arg Tyr Asp Thr Asp Lys Pro Ala Asp Ile Ala Lys Leu Lys Gln Leu
    130                      135                      140

Gly Phe Glu Ala Val Lys Leu Asp Asn Arg Thr Ile Tyr Thr Arg Cys
    145                      150                      155                      160

Val Ser Ala Lys Gly Lys Tyr Tyr Ala Thr Pro Gln Lys Leu Asn Ala
    165                      170                      175
```


Asp Tyr His Phe Glu Gln Ser Val Pro Ala Asp Ile Tyr Tyr Thr Val
 180 185 190
 Thr Glu Glu His Thr Asp Lys Ser Lys Leu Phe Ala Asn Ile Leu Tyr
 195 200 205
 Thr Pro Pro Phe Leu Ile Leu Asp Ala Ala Gly Ala Val Leu Ala Leu
 210 215 220
 Pro Ala Ala Ala Leu Gly Ala Val Val Asp Ala Ala Arg Lys
 225 230 235

<210> 1433
 <211> 714
 <212> DNA
 <213> Neisseria meningitidis

<400> 1433
 atgttggtcc gtaaaacgac cgccgccgtt ttggcggcaa ccttgatggt gaacggctgt 60
 acggtaatga tgtggggtat gaacagcccg ttcagcgaaa cgaccgcccg caaacacgtt 120
 gacaaggacc aaatccgcgc cttcgggtgtg gttgccgaag acaatgccca attggaaaag 180
 ggcagcctgg tgatgatggg cgggaaatac tggttcgtcg tcaatcctga agattcggcg 240
 aagctgacgg gcattttgaa ggccgggttg gacaagcagt ttcaaagtgt tgagcccaac 300
 ccgcgctttg cctaccaagc cctgccggtc aaactcgaat cgcccgccag ccagaatttc 360
 agtaccgaag gcctttgcct gcgctacgat accgacagac ctgccgacat cgccaagctg 420
 aaacagcttg agtttggaagc ggtcgaactc gacaatcgga ccatttacac gcgctgcgtc 480
 tccgccaaaag gcaaatacta cgccacaccg caaaaactga acgccgatta tcattttgag 540
 caaagtgtgc ctgccgatat ttattacacg gttacgaaaa aacataccga caaatccaag 600
 ttgtttgaaa atattgcata tacgccacc acgttgatac tggatgcggt gggcgcggtg 660
 ctggccttgc ctgtcgcggc gttgattgca gccacgaatt cctcagacaa atga 714

<210> 1434
 <211> 237
 <212> PRT
 <213> Neisseria meningitidis

<400> 1434
 Met Leu Phe Arg Lys Thr Thr Ala Ala Val Leu Ala Ala Thr Leu Met
 1 5 10 15
 Leu Asn Gly Cys Thr Val Met Met Trp Gly Met Asn Ser Pro Phe Ser
 20 25 30
 Glu Thr Thr Ala Arg Lys His Val Asp Lys Asp Gln Ile Arg Ala Phe
 35 40 45
 Gly Val Val Ala Glu Asp Asn Ala Gln Leu Glu Lys Gly Ser Leu Val
 50 55 60
 Met Met Gly Gly Lys Tyr Trp Phe Val Val Asn Pro Glu Asp Ser Ala
 65 70 75 80
 Lys Leu Thr Gly Ile Leu Lys Ala Gly Leu Asp Lys Gln Phe Gln Met
 85 90 95

Val Glu Pro Asn Pro Arg Phe Ala Tyr Gln Ala Leu Pro Val Lys Leu
 100 105 110
 Glu Ser Pro Ala Ser Gln Asn Phe Ser Thr Glu Gly Leu Cys Leu Arg
 115 120 125
 Tyr Asp Thr Asp Arg Pro Ala Asp Ile Ala Lys Leu Lys Gln Leu Glu
 130 135 140
 Phe Glu Ala Val Glu Leu Asp Asn Arg Thr Ile Tyr Thr Arg Cys Val
 145 150 155 160
 Ser Ala Lys Gly Lys Tyr Tyr Ala Thr Pro Gln Lys Leu Asn Ala Asp
 165 170 175
 Tyr His Phe Glu Gln Ser Val Pro Ala Asp Ile Tyr Tyr Thr Val Thr
 180 185 190
 Lys Lys His Thr Asp Lys Ser Lys Leu Phe Glu Asn Ile Ala Tyr Thr
 195 200 205
 Pro Thr Thr Leu Ile Leu Asp Ala Val Gly Ala Val Leu Ala Leu Pro
 210 215 220
 Val Ala Ala Leu Ile Ala Ala Thr Asn Ser Ser Asp Lys
 225 230 235

<210> 1435
 <211> 504
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1435
 atgcatcgagg tttcagacgg cattggagtg tcagtcgtgt tctgccgatt cgtaggcttc 60
 gacgattttt tgcaccagag gatgccggac aacgtcttcg ccggtgaagg tatggaaata 120
 cagtcctgcc acgccgtgca gtttctcacg tgcgtctttc aatcccgatt tgatgttttt 180
 gggcaggtcg atttggctgg tgtcgccggg aatgacggct ttcgcgccga agccgatgcg 240
 ggtcaggaac attttcattt gttcggggcg ggtgttttgc gcttcgtcga ggatgatgta 300
 tgcgccgttg agcgtcctgc cgcgcatata ggcgagcggg gcgatttcaa tcaggccttt 360
 ttcaatcagc ttggttacac ggtcaaagcc catcagggtca tagagggcat cataaagcgg 420
 acggaggtag gggtcgactt tttgggtcag gtctccgggc aggaagccca gtttctcacc 480
 ggcttcgacg gcaggccgaa ctaa 504

<210> 1436
 <211> 167
 <212> PRT
 <213> *Neisseria gonorrhoeae*

<400> 1436
 Met His Arg Val Ser Asp Gly Ile Gly Val Ser Val Val Phe Cys Arg
 1 5 10 15
 Phe Val Gly Phe Asp Asp Phe Leu His Gln Arg Met Pro Asp Asn Val
 20 25 30

Phe Ala Gly Glu Gly Met Glu Ile Gln Ser Cys His Ala Val Gln Phe
 35 40 45
 Leu Thr Cys Val Phe Gln Ser Arg Phe Asp Val Phe Gly Gln Val Asp
 50 55 60
 Leu Ala Gly Val Ala Gly Asn Asp Gly Phe Arg Ala Glu Ala Asp Ala
 65 70 75 80
 Gly Gln Glu His Phe His Leu Phe Gly Arg Gly Val Leu Arg Phe Val
 85 90 95
 Glu Asp Asp Val Cys Ala Val Glu Arg Pro Ala Ala His Ile Gly Glu
 100 105 110
 Arg Gly Asp Phe Asn Gln Ala Phe Phe Asn Gln Leu Gly Tyr Thr Val
 115 120 125
 Lys Ala His Gln Val Ile Glu Gly Ile Ile Lys Arg Thr Glu Val Gly
 130 135 140
 Val Asp Phe Leu Gly Gln Val Ser Gly Gln Glu Ala Gln Phe Leu Thr
 145 150 155 160
 Gly Phe Asp Gly Arg Pro Asn
 165

<210> 1437
 <211> 504
 <212> DNA
 <213> Neisseria meningitidis

<400> 1437
 atgcatcggg ttccagacgg cattggaatg tcagtcgtgt tctgccgatt cgtaggcttc 60
 gacgattttt tgcaccaaag gatgccggac aacgtcttcg ccggtaaagg tgtggaaata 120
 cagcccttcc acgttggtgca gtttctcag cgcattcttt aatcccgatt tgatgttttt 180
 gggcaggctg atttggctgg tgtcgccggt aatgacggct ttgcgcgcga agccgatgcg 240
 ggtcaggaac attttcattt gttcgggctt ggtgttttgc gcttcgtcga ggatgatgta 300
 tgcgccgttg agcgtcctgc cgcgcatata ggcgagcggg gcgatttcaa tcaggccttt 360
 ttcaatcagc ttggttacac ggtcaaagcc catcagggtca tagaggcat cataaagcgg 420
 acgaaggtag ggatcgactt tctgggtcag gtctccgggc aggaagccca gtttctcgcc 480
 ggcttcgacg gctgggcgca ctaa 504

<210> 1438
 <211> 167
 <212> PRT
 <213> Neisseria meningitidis

<400> 1438
 Met His Arg Val Ser Asp Gly Ile Gly Met Ser Val Val Phe Cys Arg
 1 5 10 15

Phe Val Gly Phe Asp Asp Phe Leu His Gln Arg Met Pro Asp Asn Val
 20 25 30
 Phe Ala Gly Lys Gly Val Glu Ile Gln Pro Phe His Val Val Gln Phe
 35 40 45
 Leu Thr Arg Ile Phe Xaa Ser Arg Phe Asp Val Phe Gly Gln Val Asp
 50 55 60
 Leu Ala Gly Val Ala Gly Asn Asp Gly Phe Arg Ala Glu Ala Asp Ala
 65 70 75 80
 Gly Gln Glu His Phe His Leu Phe Gly Arg Gly Val Leu Arg Phe Val
 85 90 95
 Glu Asp Asp Val Cys Ala Val Glu Arg Pro Ala Ala His Ile Gly Glu
 100 105 110
 Arg Gly Asp Phe Asn Gln Ala Phe Phe Asn Gln Leu Gly Tyr Thr Val
 115 120 125
 Lys Ala His Gln Val Ile Glu Gly Ile Ile Lys Arg Thr Lys Val Gly
 130 135 140
 Ile Asp Phe Leu Gly Gln Val Ser Gly Gln Glu Ala Gln Phe Leu Ala
 145 150 155 160
 Gly Phe Asp Gly Trp Ala His
 165

<210> 1439
 <211> 504
 <212> DNA
 <213> Neisseria meningitidis

<400> 1439
 atgcatcgagg tttcagacgg cattggaatg tcagtcgtgt tctgccgatt cgtaggcttc 60
 gacgattttt tgcaccaaag gatgccggac aacgtcttcg ccggtaaagg tgtggaaata 120
 cagcccttcc acgcctgca gtttctcag cgcattcttt aatcccgatt tgatgttttt 180
 gggcaggctg atttggctgg tgcgcgggt aatgacggct ttcgcgccga agccgatgcg 240
 ggtcaggaac attttcattt gttcgggct ggtgttttgc gcttcgtcga ggatgatgta 300
 tgcgcggtt agcgtctctc cgcgcataa ggcgagcggg gcaatctcaa tcagaccttt 360
 ttcaatcagc ttggtgacac ggtcgaagcc catcagggtc tagagggcat cataaagcgg 420
 acgaaggtag ggatcgactt tctgggtcag gtcaccgggc agaaaacca gtttctcgcc 480
 ggcttcgacg gcaggccgca ctaa 504

<210> 1440
 <211> 166
 <212> PRT
 <213> Neisseria meningitidis

<400> 1440
 Met His Arg Val Ser Asp Gly Ile Gly Met Ser Val Val Phe Cys Arg
 1 5 10 15

Phe Val Gly Phe Asp Asp Phe Leu His Gln Arg Met Pro Asp Asn Val
 20 25 30
 Phe Ala Gly Lys Gly Val Glu Ile Gln Pro Phe His Ala Val Gln Phe
 35 40 45
 Leu Thr Arg Ile Phe Ser Arg Phe Asp Val Phe Gly Gln Val Asp Leu
 50 55 60
 Ala Gly Val Ala Gly Asn Asp Gly Phe Arg Ala Glu Ala Asp Ala Gly
 65 70 75 80
 Gln Glu His Phe His Leu Phe Gly Arg Gly Val Leu Arg Phe Val Glu
 85 90 95
 Asp Asp Val Cys Ala Val Glu Arg Pro Ala Ala His Ile Gly Glu Arg
 100 105 110
 Gly Asn Leu Asn Gln Thr Phe Phe Asn Gln Leu Gly Asp Thr Val Glu
 115 120 125
 Ala His Gln Val Ile Glu Gly Ile Ile Lys Arg Thr Lys Val Gly Ile
 130 135 140
 Asp Phe Leu Gly Gln Val Thr Gly Gln Lys Thr Gln Phe Leu Ala Gly
 145 150 155 160
 Phe Asp Gly Arg Pro His
 165

<210> 1441
 <211> 348
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1441
 atgacgtttt cggcggcaaa gctcaacatt tcggcactga tgttgtgtct ttcggcagga 60
 atgaccgttt tactttccgc ttttttactg ctccgaccgg aaggcagcat cttattcaac 120
 cattttttca gcataaatat tctgaccgga agagcggcat ctccacgggc aaccgtgttc 180
 agactgcatac aggcggtacg attccacaag atgccgaaaa ccataagcaa aatgcgtaga 240
 aactacgccg tccgaatcac gccgcctcct cgggcggcaa cgcttcatta taacagattg 300
 ccccttaaaa aatcagaccc tgcttttgtg gcgagagtctg aaatttga 348

<210> 1442
 <211> 115
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1442
 Met Thr Phe Ser Ala Ala Lys Leu Asn Ile Ser Ala Leu Met Leu Cys
 1 5 10 15
 Leu Ser Ala Gly Met Thr Val Leu Leu Ser Ala Phe Leu Leu Arg
 20 25 30

Arg Leu Pro Ser Ala Ala Gly Leu Val Arg Arg Glu Arg Arg Arg Cys
 100 105 110

Ala Val Ile Leu Ser Asn Gly Arg Lys Lys Ser Asp Pro Ala Phe Val
 115 120 125

Ala Glu Ser Glu Ile
 130

<210> 1445
 <211> 344
 <212> DNA
 <213> Neisseria meningitidis

<400> 1445
 atgacgtttt cggcggcaaa gctcaacatt tcggcacgga tgttgtgtct ttcggcagga 60
 atgaccgttt tactttccgc ttttttactg ctccgaccgg aaggcagcat cttattcaac 120
 cattttttca gcataaatat tctaaccgga agagcggcat ctccacgggc aaccgtgttc 180
 agacggcatc aggcggtacg attccgcaag atgccgacca taaacaaaag gcgtagaaac 240
 tacgccgtcc gaatcacgcc gtctcgcgg cggaacgcg tcattataac agattgccct 300
 ccaaaaaatc agaccctgct tttgtggcag agtctgaaat ttga 344

<210> 1446
 <211> 114
 <212> PRT
 <213> Neisseria meningitidis

<400> 1446
 Met Thr Phe Ser Ala Ala Lys Leu Asn Ile Ser Ala Arg Met Leu Cys
 1 5 10 15

Leu Ser Ala Gly Met Thr Val Leu Leu Ser Ala Phe Leu Leu Leu Arg
 20 25 30

Pro Glu Gly Ser Ile Leu Phe Asn His Phe Phe Ser Ile Asn Ile Leu
 35 40 45

Thr Arg Arg Ala Ala Ser Pro Arg Ala Thr Val Phe Arg Arg His Gln
 50 55 60

Ala Val Arg Phe Arg Lys Met Pro Thr Ile Asn Lys Arg Arg Arg Asn
 65 70 75 80

Tyr Ala Val Arg Ile Thr Pro Ser Ser Xaa Ala Ala Thr Arg His Tyr
 85 90 95

Asn Arg Leu Pro Ser Lys Lys Ser Asp Pro Ala Phe Val Ala Glu Ser
 100 105 110

Glu Ile

<210> 1447

<211> 951
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1447
 atggaat tttt tcattatctt gttggcagcc gtcgccgttt tcggcttcaa atcctttgtc 60
 gtcaccccc agcaggaagt ccacgttgct gaaaggctcg ggcgtttcca tcgcgccttg 120
 acggccgggt tgaatat tttt gattcccttt atcgaccgcg tcgcctaccg ccattcgctg 180
 aaagaaatcc ctttagacgt acccagccag gtctgcatca cgcgcgataa tacgcaattg 240
 actgttgacg gcatcatcta tttccaagta accgatccca aactcgcctc atacggttcg 300
 agcaactaca ttatggcaat taccagctt gcccaaacga cgtcgcgttc cgttatcggg 360
 cgtatggagt tggacaaaac gtttgaagaa cgcgacgaaa tcaacagtac cgtcgtctcc 420
 gccctcgatg aagccgcccg ggcttggggg gtgaaagtcc tccgttacga aatcaaggat 480
 ttggttccgc cgcaagaaat ccttcgcgca atgcaggcac aaattaccgc cgaacgcgaa 540
 aaacgcgccc gtattgccga atccgaaggc cgtaaaatcg aacaaatcaa ccttgccagt 600
 ggtcagcgtg aagccgaaat ccaacaatcc gaaggcgagg ctcaggctgc ggtcaatgcg 660
 tccaatgccg agaaaatcgc ccgcatcaac cgcgccaaag gcgaagcgga atccctgcgc 720
 cttgttgccg aagccaatgc cgaagccaac cgtcaaattg ccgccgccct tcaaacccaa 780
 agcggggcgg atgcggtcaa tctgaagatt gcgggacaat acgttaccgc gttcaaaaat 840
 cttgccaaaag aagacaatac gcggattaag cccgccaaag ttgccgaaat cgggaaccct 900
 aat ttttcggc ggcatgaaaa attttcgcc gaagcaaaaa cggccaaata a 951

<210> 1448
 <211> 316
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1448
 Met Glu Phe Phe Ile Ile Leu Leu Ala Ala Val Ala Val Phe Gly Phe
 1 5 10 15
 Lys Ser Phe Val Val Ile Pro Gln Gln Glu Val His Val Val Glu Arg
 20 25 30
 Leu Gly Arg Phe His Arg Ala Leu Thr Ala Gly Leu Asn Ile Leu Ile
 35 40 45
 Pro Phe Ile Asp Arg Val Ala Tyr Arg His Ser Leu Lys Glu Ile Pro
 50 55 60
 Leu Asp Val Pro Ser Gln Val Cys Ile Thr Arg Asp Asn Thr Gln Leu
 65 70 75 80
 Thr Val Asp Gly Ile Ile Tyr Phe Gln Val Thr Asp Pro Lys Leu Ala
 85 90 95
 Ser Tyr Gly Ser Ser Asn Tyr Ile Met Ala Ile Thr Gln Leu Ala Gln
 100 105 110
 Thr Thr Leu Arg Ser Val Ile Gly Arg Met Glu Leu Asp Lys Thr Phe
 115 120 125
 Glu Glu Arg Asp Glu Ile Asn Ser Thr Val Val Ser Ala Leu Asp Glu
 130 135 140
 Ala Ala Gly Ala Trp Gly Val Lys Val Leu Arg Tyr Glu Ile Lys Asp

| | | | |
|---|-----|-----|-----|
| 145 | 150 | 155 | 160 |
| Leu Val Pro Pro Gln Glu Ile Leu Arg Ala Met Gln Ala Gln Ile Thr | 165 | 170 | 175 |
| Ala Glu Arg Glu Lys Arg Ala Arg Ile Ala Glu Ser Glu Gly Arg Lys | 180 | 185 | 190 |
| Ile Glu Gln Ile Asn Leu Ala Ser Gly Gln Arg Glu Ala Glu Ile Gln | 195 | 200 | 205 |
| Gln Ser Glu Gly Glu Ala Gln Ala Ala Val Asn Ala Ser Asn Ala Glu | 210 | 215 | 220 |
| Lys Ile Ala Arg Ile Asn Arg Ala Lys Gly Glu Ala Glu Ser Leu Arg | 225 | 230 | 235 |
| Leu Val Ala Glu Ala Asn Ala Glu Ala Asn Arg Gln Ile Ala Ala Ala | 245 | 250 | 255 |
| Leu Gln Thr Gln Ser Gly Ala Asp Ala Val Asn Leu Lys Ile Ala Gly | 260 | 265 | 270 |
| Gln Tyr Val Thr Ala Phe Lys Asn Leu Ala Lys Glu Asp Asn Thr Arg | 275 | 280 | 285 |
| Ile Lys Pro Ala Lys Val Ala Glu Ile Gly Asn Pro Asn Phe Arg Arg | 290 | 295 | 300 |
| His Glu Lys Phe Ser Pro Glu Ala Lys Thr Ala Lys | 305 | 310 | 315 |

<210> 1449
 <211> 600
 <212> DNA
 <213> Neisseria meningitidis

<400> 1449
 tccgttatcg ggcgtatgga gttggacaaa acgtttgaag aacgcgacga aatcaacagt 60
 actgttggtt cggttttga cgaggcggcc ggggcttggg gtgtgaaggt tttgcgttat 120
 gagattaaag acttggttcc gccgcaagaa atccttcgct caatgcaggc gcaaattact 180
 gccgaacgcg aaaaacgcgc ccgtatcgcc gaatccgaag gtcgtaaaat cgaacaaatc 240
 aaccttgcca gtggtcagcg cgaagccgaa atccaacaat ccgaaggcga ggctcaggct 300
 gcggtcaatg cgtcaaatgc cgagaaaatc gcccgcatca accgcgcaa aggtgaagcg 360
 gaatccttgc gccttggtgc cgaagccaat gccgaagcca tccgtcaa at tgccgcgcc 420
 cttcaaacc aaggcggtgc ggaatgcggtc aatctgaaga ttgcggaaca atacgtcgct 480
 gcgttcaaca atcttgccaa agaaagcaat acgctgatta tgccgcgcaa tggtgccgac 540
 atcggcagcc tgatttctgc cggtatgaaa attatcgaca gcagcaaaac cgccaaataa 600

<210> 1450
 <211> 199
 <212> PRT
 <213> Neisseria meningitidis

<400> 1450

Ser Val Ile Gly Arg Met Glu Leu Asp Lys Thr Phe Glu Glu Arg Asp
 1 5 10 15
 Glu Ile Asn Ser Thr Val Val Ala Ala Leu Asp Glu Ala Ala Gly Ala
 20 25 30
 Trp Gly Val Lys Val Leu Arg Tyr Glu Ile Lys Asp Leu Val Pro Pro
 35 40 45
 Gln Glu Ile Leu Arg Ser Met Gln Ala Gln Ile Thr Ala Glu Arg Glu
 50 55 60
 Lys Arg Ala Arg Ile Ala Glu Ser Glu Gly Arg Lys Ile Glu Gln Ile
 65 70 75 80
 Asn Leu Ala Ser Gly Gln Arg Glu Ala Glu Ile Gln Gln Ser Glu Gly
 85 90 95
 Glu Ala Gln Ala Ala Val Asn Ala Ser Asn Ala Glu Lys Ile Ala Arg
 100 105 110
 Ile Asn Arg Ala Lys Gly Glu Ala Glu Ser Leu Arg Leu Val Ala Glu
 115 120 125
 Ala Asn Ala Glu Ala Ile Arg Gln Ile Ala Ala Ala Leu Gln Thr Gln
 130 135 140
 Gly Gly Ala Asp Ala Val Asn Leu Lys Ile Ala Glu Gln Tyr Val Ala
 145 150 155 160
 Ala Phe Asn Asn Leu Ala Lys Glu Ser Asn Thr Leu Ile Met Pro Ala
 165 170 175
 Asn Val Ala Asp Ile Gly Ser Leu Ile Ser Ala Gly Met Lys Ile Ile
 180 185 190
 Asp Ser Ser Lys Thr Ala Lys
 195

<210> 1451

<211> 948

<212> DNA

<213> *Neisseria meningitidis*

<400> 1451

atggaatttt tcattatctt gctggcagcc gtcgttggtt tcggtttcaa atcctttggt 60
 gtcattccac agcaggaagt ccacgttggtc gaaaggctcg ggcgtttcca tcgcgccttg 120
 acggccggtt tgaatatttt gattcccttt atcgaccgcg tcgcctaccg ccattcgctg 180
 aaagaaatcc ctttagacgt acccagccag gtctgcatca cgcgcgacaa tacgcagctg 240
 actgttgacg gtatcatcta tttccaagta accgaccca aactcgctc atacggttcg 300
 agcaactaca ttatggcgat taccagctt gcccaaacga cgctgcgttc cgttatcggg 360
 cgtatggaat tggacaaaac gtttgaagaa cgcgacgaaa tcaacagcac cgtcgtctcc 420
 gccctcgatg aagccgccgg agcttggggg gtgaagggtt tgcgttatga gattaaagac 480
 ttggttccgc cgcaagaaat ccttcgctca atgcaggcgc aaattactgc tgaacgcgaa 540
 aaacgcgccc gtatcgccga atccgaaggt cgtaaaatcg aacaaatcaa ccttgccagt 600

```

ggtcagcgcg aagccgaaat ccaacaatcc gaaggcgagg ctcagggtgc ggtcaatgcg 660
tcaaattgccg agaaaatcgc ccgcatcaac cgcgccaaag gtgaagcgga atccttgccg 720
cttggtgccc aagccaatgc cgaagccatc cgtcaaattg ccgccgcctt tcaaaccctaa 780
ggcgggtgcgg atgcgggtcaa tctgaagatt gcggaacaat acgtcgccgc gttcaacaat 840
cttgccaaag aaagcaatac gctgattatg cccgccaatg ttgcgcacat cggcagcctg 900
atttctgccg gtatgaaaat tatcgacagc agcaaaaaccg ccaaataa 948

```

<210> 1452

<211> 315

<212> PRT

<213> *Neisseria meningitidis*

<400> 1452

```

Met Glu Phe Phe Ile Ile Leu Leu Ala Ala Val Val Val Phe Gly Phe
  1             5             10             15

```

```

Lys Ser Phe Val Val Ile Pro Gln Gln Glu Val His Val Val Glu Arg
          20             25             30

```

```

Leu Gly Arg Phe His Arg Ala Leu Thr Ala Gly Leu Asn Ile Leu Ile
  35             40             45

```

```

Pro Phe Ile Asp Arg Val Ala Tyr Arg His Ser Leu Lys Glu Ile Pro
  50             55             60

```

```

Leu Asp Val Pro Ser Gln Val Cys Ile Thr Arg Asp Asn Thr Gln Leu
  65             70             75             80

```

```

Thr Val Asp Gly Ile Ile Tyr Phe Gln Val Thr Asp Pro Lys Leu Ala
          85             90             95

```

```

Ser Tyr Gly Ser Ser Asn Tyr Ile Met Ala Ile Thr Gln Leu Ala Gln
 100             105             110

```

```

Thr Thr Leu Arg Ser Val Ile Gly Arg Met Glu Leu Asp Lys Thr Phe
 115             120             125

```

```

Glu Glu Arg Asp Glu Ile Asn Ser Thr Val Val Ser Ala Leu Asp Glu
 130             135             140

```

```

Ala Ala Gly Ala Trp Gly Val Lys Val Leu Arg Tyr Glu Ile Lys Asp
 145             150             155             160

```

```

Leu Val Pro Pro Gln Glu Ile Leu Arg Ser Met Gln Ala Gln Ile Thr
 165             170             175

```

```

Ala Glu Arg Glu Lys Arg Ala Arg Ile Ala Glu Ser Glu Gly Arg Lys
 180             185             190

```

```

Ile Glu Gln Ile Asn Leu Ala Ser Gly Gln Arg Glu Ala Glu Ile Gln
 195             200             205

```

```

Gln Ser Glu Gly Glu Ala Gln Ala Ala Val Asn Ala Ser Asn Ala Glu
 210             215             220

```

```

Lys Ile Ala Arg Ile Asn Arg Ala Lys Gly Glu Ala Glu Ser Leu Arg

```


Pro Phe Ile Asp Arg Val Ala Tyr Arg His Ser Leu Lys Glu Ile Pro
 50 55 60
 Leu Asp Val Pro Ser Gln Val Cys Ile Thr Arg Asp Asn Thr Gln Leu
 65 70 75 80
 Thr Val Asp Gly Ile Ile Tyr Phe Gln Val Thr Asp Pro Lys Leu Ala
 85 90 95
 Ser Tyr Gly Ser Ser Asn Tyr Ile Met Ala Ile Thr Gln Leu Ala Gln
 100 105 110
 Thr Thr Leu Arg Ser Val Ile Gly Arg Met Glu Leu Asp Lys Thr Phe
 115 120 125
 Glu Glu Arg Asp Glu Ile Asn Ser Thr Val Val Ser Ala Leu Asp Glu
 130 135 140
 Ala Ala Gly Ala Trp Gly Val Lys Val Leu Arg Tyr Glu Ile Lys Asp
 145 150 155 160
 Leu Val Pro Pro Gln Glu Ile Leu Arg Ala Met Gln Ala Gln Ile Thr
 165 170 175
 Ala Glu Arg Glu Lys Arg Ala Arg Ile Ala Glu Ser Glu Gly Arg Lys
 180 185 190
 Ile Glu Gln Ile Asn Leu Ala Ser Gly Gln Arg Glu Ala Glu Ile Gln
 195 200 205
 Gln Ser Glu Gly Glu Ala Gln Ala Ala Val Asn Ala Ser Asn Ala Glu
 210 215 220
 Lys Ile Ala Arg Ile Asn Arg Ala Lys Gly Glu Ala Glu Ser Leu Arg
 225 230 235 240
 Leu Val Ala Glu Ala Asn Ala Glu Ala Ile Arg Gln Ile Ala Ala Ala
 245 250 255
 Leu Gln Thr Gln Gly Gly Ala Asp Ala Val Asn Leu Lys Ile Ala Glu
 260 265 270
 Gln Tyr Val Ala Ala Phe Asn Asn Leu Ala Lys Glu Ser Asn Thr Leu
 275 280 285
 Ile Met Pro Ala Asn Val Ala Asp Ile Gly Ser Leu Ile Ser Ala Gly
 290 295 300
 Met Lys Ile Ile Asp Ser Ser Lys Thr Ala Lys
 305 310 315

<210> 1455

<211> 948

<212> DNA

<213> Neisseria meningitidis

<400> 1455

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atggaatttt tcattatctt gttggtagcc gtcgccgttt tcggtttcaa atcctttgtt 60
gtcatcccac aacaggaagt ccacgttgtc gaaaggctgg ggcgtttcca tcgcgccttg 120
acggccgggt tgaatatttt gattcccttt atcgaccgcg tcgcctaccg ccattcgctg 180
aaagaaatcc ctttagacgt acccagccag gtctgcatca cgcgcgacaa tacgcagctg 240
actgttgacg gcatcatcta tttccaagta accgacccca aactcgcctc atacggttcg 300
agcaactaca ttatggcgat taccagctt gcccaaacga cgctgcgttc cgttatcggg 360
```

```
cgtatggagt tggacaaaac gtttgaagaa cgcgacgaaa tcaacagtac tgttgttgcg 420
gctttggacg aggcggccgg ggcttggggg gtgaagggtt tgcgttatga gattaaagac 480
ttggttccgc cgcaagaaat ctttcgctca atgcaggcgc aaattactgc cgaacgcgaa 540
aaacgcgccc gtatcgccga atccgaaggt cgtaaaatcg aacaaatcaa ctttgccagt 600
ggtcagcgcg aagccgaaat ccaacaatcc gaaggcgagg ctgaggctgc ggtcaatgcg 660
tcaaattgcc agaaaatcgc ccgcatcaac cgcgccaaaag gtgaagcgga atccttgccg 720
cttgttgccg aagccaatgc cgaagccatc cgtcaaattg ccgcgcgcct tcaaacccaa 780
ggcgggtgcg atgcggtcaa tctgaagatt gcggaacaat acgtcgctgc gttcaacaat 840
cttgccaaag aaagcaatac gctgattatg cccgccaatg ttgccgacat cggcagcctg 900
atttctgccc gtatgaaaat tatcgacagc agcaaaaccg ccaaataa 948
```

<210> 1456

<211> 315

<212> PRT

<213> *Neisseria meningitidis*

<400> 1456

```
Met Glu Phe Phe Ile Ile Leu Leu Val Ala Val Ala Val Phe Gly Phe
  1                   5                   10                   15
```

```
Lys Ser Phe Val Val Ile Pro Gln Gln Glu Val His Val Val Glu Arg
                20                   25                   30
```

```
Leu Gly Arg Phe His Arg Ala Leu Thr Ala Gly Leu Asn Ile Leu Ile
  35                   40                   45
```

```
Pro Phe Ile Asp Arg Val Ala Tyr Arg His Ser Leu Lys Glu Ile Pro
  50                   55                   60
```

```
Leu Asp Val Pro Ser Gln Val Cys Ile Thr Arg Asp Asn Thr Gln Leu
  65                   70                   75                   80
```

```
Thr Val Asp Gly Ile Ile Tyr Phe Gln Val Thr Asp Pro Lys Leu Ala
                85                   90                   95
```

```
Ser Tyr Gly Ser Ser Asn Tyr Ile Met Ala Ile Thr Gln Leu Ala Gln
  100                   105                   110
```

```
Thr Thr Leu Arg Ser Val Ile Gly Arg Met Glu Leu Asp Lys Thr Phe
  115                   120                   125
```

```
Glu Glu Arg Asp Glu Ile Asn Ser Thr Val Val Ala Ala Leu Asp Glu
  130                   135                   140
```

```
Ala Ala Gly Ala Trp Gly Val Lys Val Leu Arg Tyr Glu Ile Lys Asp
  145                   150                   155                   160
```

```
Leu Val Pro Pro Gln Glu Ile Leu Arg Ser Met Gln Ala Gln Ile Thr
```

| | | |
|---|---------------------------------|-----|
| 165 | 170 | 175 |
| Ala Glu Arg Glu Lys Arg Ala Arg | Ile Ala Glu Ser Glu Gly Arg Lys | |
| 180 | 185 | 190 |
| Ile Glu Gln Ile Asn Leu Ala Ser Gly Gln Arg Glu Ala Glu Ile Gln | | |
| 195 | 200 | 205 |
| Gln Ser Glu Gly Glu Ala Gln Ala Ala Val Asn Ala Ser Asn Ala Glu | | |
| 210 | 215 | 220 |
| Lys Ile Ala Arg Ile Asn Arg Ala Lys Gly Glu Ala Glu Ser Leu Arg | | |
| 225 | 230 | 235 |
| Leu Val Ala Glu Ala Asn Ala Glu Ala Ile Arg Gln Ile Ala Ala Ala | | |
| 245 | 250 | 255 |
| Leu Gln Thr Gln Gly Gly Ala Asp Ala Val Asn Leu Lys Ile Ala Glu | | |
| 260 | 265 | 270 |
| Gln Tyr Val Ala Ala Phe Asn Asn Leu Ala Lys Glu Ser Asn Thr Leu | | |
| 275 | 280 | 285 |
| Ile Met Pro Ala Asn Val Ala Asp Ile Gly Ser Leu Ile Ser Ala Gly | | |
| 290 | 295 | 300 |
| Met Lys Ile Ile Asp Ser Ser Lys Thr Ala Lys | | |
| 305 | 310 | 315 |

<210> 1457

<211> 948

<212> DNA

<213> Neisseria meningitidis

<400> 1457

```

atggaatttt tcattatctt gctggcagcc gtcgttgttt tcggcttcaa atcctttgtt 60
gtcatcccac agcaggaagt ccacgttgtc gaaaggctcg ggcgtttcca tcgcgccctg 120
acggccggtt tgaatatctt gattcccttt atcgaccgog tcgcctaccg ccattcgctg 180
aaagaaatcc ctttagacgt acccagccag gtctgcatca cgcgcgacaa tacgcagctg 240
actgttgacg gtatcatcta ttccaagta accgacccca aactcgctc atacggttcg 300
agcaactaca ttatggogat taccagctt gcccaaacga cgtgcggttc cgttatcggg 360
cgtatggaat tggacaaaac gtttgaagaa cgcgacgaaa tcaacagcac cgtcgtctcc 420
gccctcgatg aagccgccgg agcttggggg gtgaagggtt tgcgttatga gattaaagac 480
ttggttccgc cgcaagaaat ctttcgtca atgcaggcgc aaattactgc tgaacgcgaa 540
aaacgcgccc gtatcgccga atccgaaggt cgtaaaatcg aacaaatcaa ccttgccagt 600
ggtcagcgcg aagccgaaat ccaacaatcc gaaggcgagg ctcaggctgc ggtcaatgcg 660
tcaaatgcgc agaaaatcgc ccgcatcaac cgcgccaaag gtgaagcgga atccttgccg 720
cttggttccg aagccaatgc cgaagccatc cgtcaaattg ccgcgcctt tcaaacccaa 780
ggcgggtcgc atgcggtcaa tctgaagatt gcggaacaat acgtcgccgc gttcaacaat 840
cttgccaaag aaagcaatac gctgattatg cccgccaatg ttgccgacat cggcagcctg 900
atttctgcgc gtatgaaaaa tatcgacagc agcaaaaccg ccaaataa 948

```

<210> 1458

<211> 315

<212> PRT

<213> Neisseria meningitidis

<400> 1458

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Met | Glu | Phe | Phe | Ile | Ile | Leu | Leu | Ala | Ala | Val | Val | Val | Phe | Gly | Phe | | |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | | | |
| Lys | Ser | Phe | Val | Val | Ile | Pro | Gln | Gln | Glu | Val | His | Val | Val | Glu | Arg | | |
| | | | 20 | | | | 25 | | | | | | 30 | | | | |
| Leu | Gly | Arg | Phe | His | Arg | Ala | Leu | Thr | Ala | Gly | Leu | Asn | Ile | Leu | Ile | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Pro | Phe | Ile | Asp | Arg | Val | Ala | Tyr | Arg | His | Ser | Leu | Lys | Glu | Ile | Pro | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Leu | Asp | Val | Pro | Ser | Gln | Val | Cys | Ile | Thr | Arg | Asp | Asn | Thr | Gln | Leu | | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | | |
| Thr | Val | Asp | Gly | Ile | Ile | Tyr | Phe | Gln | Val | Thr | Asp | Pro | Lys | Leu | Ala | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | |
| Ser | Tyr | Gly | Ser | Ser | Asn | Tyr | Ile | Met | Ala | Ile | Thr | Gln | Leu | Ala | Gln | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| Thr | Thr | Leu | Arg | Ser | Val | Ile | Gly | Arg | Met | Glu | Leu | Asp | Lys | Thr | Phe | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Glu | Glu | Arg | Asp | Glu | Ile | Asn | Ser | Thr | Val | Val | Ser | Ala | Leu | Asp | Glu | | |
| | | 130 | | | | 135 | | | | | 140 | | | | | | |
| Ala | Ala | Gly | Ala | Trp | Gly | Val | Lys | Val | Leu | Arg | Tyr | Glu | Ile | Lys | Asp | | |
| 145 | | | | | 150 | | | | 155 | | | | | 160 | | | |
| Leu | Val | Pro | Pro | Gln | Glu | Ile | Leu | Arg | Ser | Met | Gln | Ala | Gln | Ile | Thr | | |
| | | | | 165 | | | | 170 | | | | | | 175 | | | |
| Ala | Glu | Arg | Glu | Lys | Arg | Ala | Arg | Ile | Ala | Glu | Ser | Glu | Gly | Arg | Lys | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| Ile | Glu | Gln | Ile | Asn | Leu | Ala | Ser | Gly | Gln | Arg | Glu | Ala | Glu | Ile | Gln | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Gln | Ser | Glu | Gly | Glu | Ala | Gln | Ala | Ala | Val | Asn | Ala | Ser | Asn | Ala | Glu | | |
| | | 210 | | | | 215 | | | | | 220 | | | | | | |
| Lys | Ile | Ala | Arg | Ile | Asn | Arg | Ala | Lys | Gly | Glu | Ala | Glu | Ser | Leu | Arg | | |
| 225 | | | | | 230 | | | | | 235 | | | | 240 | | | |
| Leu | Val | Ala | Glu | Ala | Asn | Ala | Glu | Ala | Ile | Arg | Gln | Ile | Ala | Ala | Ala | | |
| | | | | 245 | | | | 250 | | | | | 255 | | | | |
| Leu | Gln | Thr | Gln | Gly | Gly | Ala | Asp | Ala | Val | Asn | Leu | Lys | Ile | Ala | Glu | | |
| | | | 260 | | | | 265 | | | | | | 270 | | | | |
| Gln | Tyr | Val | Ala | Ala | Phe | Asn | Asn | Leu | Ala | Lys | Glu | Ser | Asn | Thr | Leu | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | |

Ile Met Pro Ala Asn Val Ala Asp Ile Gly Ser Leu Ile Ser Ala Gly
290 295 300

Met Lys Ile Ile Asp Ser Ser Lys Thr Ala Lys
305 310 315

<210> 1459

<211> 594

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1459

```
atgcctgcgc ttctttcaat acgtcgggca aacgcgctgc ctttttcgcg catttcggaa 60
aggatgaagt tgctggtgcc gttaataatg cgggcgatgg atttaatcct gtttgccgcc 120
aaaccttcgc gcacggcttt gatgattggg ataccgcccg ctactgccgc ttcaaattgg 180
acgatgacgt tttgtttttc cgccagcggg aagatttcgt tgccgtattc ggcgagcagt 240
tttttgttgg cggtaacgat gtgtttgccg ttttcaatgg ctttcaacac cgcttctttg 300
gcaatgcccg tgccgccgaa caattcgacc aagacatcga cgtctttacg cgcgaaacagt 360
tcgaacggat cttttgacaa gggcgggcca cgggccgatt ttggcgggct ttttcttcgc 420
ttaagtgcga catggcagaa atacggattt cgcgccccaa gcggcgggaa atttcctctg 480
cgttgtcccg caacacggca gccgcaccgc cgccgaccgt acctaagcct aaaagaccga 540
tgtttactgg cttcattgtg tctccttgta agccgactga aatgtaaata ttga 594
```

<210> 1460

<211> 197

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1460

Met Pro Ala Leu Leu Ser Ile Arg Arg Ala Asn Ala Leu Pro Phe Ser
1 5 10 15

Arg Ile Ser Glu Arg Met Lys Leu Leu Val Pro Leu Ile Met Pro Ala
20 25 30

Met Asp Leu Ile Leu Phe Ala Ala Lys Pro Ser Arg Thr Ala Leu Met
35 40 45

Ile Gly Ile Pro Pro Ala Thr Ala Ala Ser Asn Trp Thr Met Thr Phe
50 55 60

Cys Phe Ser Ala Ser Gly Lys Ile Ser Leu Pro Tyr Ser Ala Ser Ser
65 70 75 80

Phe Leu Leu Ala Val Thr Met Cys Leu Pro Phe Ser Met Ala Phe Asn
85 90 95

Thr Ala Ser Leu Ala Met Pro Val Pro Pro Asn Asn Ser Thr Lys Thr
100 105 110

Ser Thr Ser Leu Arg Ala Asn Ser Ser Asn Gly Ser Phe Asp Lys Gly
115 120 125

Gly Arg Arg Ala Asp Phe Gly Gly Leu Phe Leu Arg Leu Ser Arg Thr

130 135 140
 Trp Gln Lys Tyr Gly Phe Arg Ala Pro Ser Gly Gly Lys Phe Pro Leu
 145 150 155 160
 Arg Cys Pro Ala Thr Arg Gln Pro His Arg Arg Arg Pro Tyr Leu Ser
 165 170 175
 Leu Lys Asp Arg Cys Leu Leu Ala Ser Leu Cys Leu Leu Val Ser Arg
 180 185 190
 Leu Lys Cys Lys Tyr
 195

<210> 1461
 <211> 592
 <212> DNA
 <213> Neisseria meningitidis

<400> 1461
 atgcctgcgc ttctttcagt acatcggcaa acgcgctgcc tttttcgcgc atttcggrka 60
 ggatgaagtt gctggtgccg ttaataatgc cggcgatgga tttaatcctg tttgccgcca 120
 aaccttcgcg cagggctttg atgattggga taccgccgcg tactgccgct tcaaattgga 180
 cgatgacgtt ttgtttttcc gccagcggga agatttcgtt gccgtattcg gcgagcagtt 240
 ttttgttggc ggtaacgatg tgtttgccgt tttcaatggc tttcaacacc gcattctttg 300
 caatgccggt accgccgaac aattcgacga cgacatcgac gtcttcacgt gcgaccagtt 360
 cgaacggatc tttgacaaaag gctgccggac gggcagggtt gtccgggcttt ttcttcactc 420
 aaatcgacac cggcagaaat acggatttcg cgcaccaagc gacgggaaat ttcttcgcgc 480
 ttgtcscgca acacggcagc cgtaccgccg ccgaccgtac ccaaacctaa aagaccgatg 540
 ttctactggct tcattgtgtc tccttgtaag ccgactgaaa tgtaaatatt ga 592

<210> 1462
 <211> 197
 <212> PRT
 <213> Neisseria meningitidis

<400> 1462
 Met Pro Ala Leu Leu Ser Val His Xaa Ala Asn Ala Leu Pro Phe Ser
 1 5 10 15
 Arg Ile Ser Xaa Arg Met Lys Leu Leu Val Pro Leu Ile Met Pro Ala
 20 25 30
 Met Asp Leu Ile Leu Phe Ala Ala Lys Pro Ser Arg Arg Ala Leu Met
 35 40 45
 Ile Gly Ile Pro Pro Ala Thr Ala Ala Ser Asn Trp Thr Met Thr Phe
 50 55 60
 Cys Phe Ser Ala Ser Gly Lys Ile Ser Leu Pro Tyr Ser Ala Ser Ser
 65 70 75 80
 Phe Leu Leu Ala Val Thr Met Cys Leu Pro Phe Ser Met Ala Phe Asn
 85 90 95

Thr Ala Ser Leu Ala Met Pro Val Pro Pro Asn Asn Ser Thr Thr Thr
 100 105 110
 Ser Thr Ser Ser Arg Ala Thr Ser Ser Asn Gly Ser Leu Thr Lys Ala
 115 120 125
 Xaa Arg Thr Gly Arg Phe Val Gly Leu Phe Leu His Ser Asn Arg Thr
 130 135 140
 Arg Gln Lys Tyr Gly Phe Arg Ala Pro Ser Asp Gly Lys Phe Pro Pro
 145 150 155 160
 Arg Cys Xaa Ala Thr Arg Gln Pro Tyr Arg Arg Arg Pro Tyr Pro Asn
 165 170 175
 Leu Lys Asp Arg Cys Leu Leu Ala Ser Leu Cys Leu Leu Val Ser Arg
 180 185 190
 Leu Lys Cys Lys Tyr
 195

<210> 1463
 <211> 591
 <212> DNA
 <213> Neisseria meningitidis

<400> 1463
 atgcctgcgc ttctttcagt acatcggcaa acgcgctgcc tttttcgcgc atttcggaga 60
 ggatgaagtt gctggtgccg ttaataatgc cggcgatgga tttaatcctg ttgcccga 120
 aaccttcgcg cagggctttg atgattggga taccgcccgc tactgcccgt tcaaattgga 180
 cgatgacgtt ttgtttttcc gccagcggga agatttcgtt gccgtattcg gcgagcagtt 240
 tttgtttggc ggtaacgatg tgtttgccgt tttcaatggc tttcaacacc gcatctttgg 300
 caatgccggt accgccgaac aattcgacga cgacatcgac gtcttcacgt gcgaccagtt 360
 cgaacggatc tttgacaaaag gctgcggacg ggcagggtttg tcgggctttt tcttcactca 420
 aatcgcacac ggcagaaata cggatttcgc gccccaagcg acgggaaatt tcctccgcgt 480
 tgtcccgaac cacggcagcc gtaccgccgc cgaccgtacc caaacctaaa agaccgatgt 540
 ttactggctt catttgtgtc ccttgtaagc cgactgaaat gtaaattattg a 591

<210> 1464
 <211> 197
 <212> PRT
 <213> Neisseria meningitidis

<400> 1464
 Met Pro Ala Leu Leu Ser Val His Arg Xaa Asn Ala Leu Pro Phe Ser
 1 5 10 15
 Arg Ile Ser Glu Arg Met Lys Leu Leu Val Pro Leu Ile Met Pro Ala
 20 25 30
 Met Asp Leu Ile Leu Phe Ala Ala Lys Pro Ser Arg Arg Ala Leu Met
 35 40 45
 Ile Gly Ile Pro Pro Ala Thr Ala Ala Ser Asn Trp Thr Met Thr Phe
 50 55 60

Cys Phe Ser Ala Ser Gly Lys Ile Ser Leu Pro Tyr Ser Ala Ser Ser
 65 70 75 80
 Phe Leu Leu Ala Val Thr Met Cys Leu Pro Phe Ser Met Ala Phe Asn
 85 90 95
 Thr Ala Ser Leu Ala Met Pro Val Pro Pro Asn Asn Ser Thr Thr Thr
 100 105 110
 Ser Thr Ser Ser Arg Ala Thr Ser Ser Asn Gly Ser Leu Thr Lys Ala
 115 120 125
 Xaa Arg Thr Gly Arg Phe Val Gly Leu Phe Leu His Ser Asn Arg Thr
 130 135 140
 Arg Gln Lys Tyr Gly Phe Arg Ala Pro Ser Asp Gly Lys Phe Pro Pro
 145 150 155 160
 Arg Cys Pro Ala Thr Arg Gln Pro Tyr Arg Arg Arg Pro Tyr Pro Asn
 165 170 175
 Leu Lys Asp Arg Cys Leu Leu Ala Ser Leu Cys Leu Leu Val Ser Arg
 180 185 190
 Leu Lys Cys Lys Tyr
 195

<210> 1465

<211> 522

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1465

atgaagttgc tgggtgccgtt aataatgccg gcgatggatt taatcctggt tgccgccaaa 60
 ccttcgcgca gggctttgat gattgggata ccgcccgtta ctgccgcttc aaattggacg 120
 atgacgtttt gtttttccgc cagcgggaag atttcgttgc cgtattcggc gagcagtttt 180
 ttgttgccg taacgatgtg ttgtccgttt tcaatggctt tcaacaccgc ttctttggca 240
 atgcccggtc cgccgaacaa ttcgacgacg acatcgacgt ctttacgcgc gaccagttcg 300
 aacggatctt tgacaaaggc ggcggacggg cagatttggc gggctttttc ttcgcttaag 360
 tcgcacatgg cagaaatacg gatttcgcgc cccaagcggc gggaaatttc ctctgcgttg 420
 tcccgcaca cggcagccgc accgccgccg accgtacctt agcctaaaag accgatgttt 480
 actggcttca ttgtgtctcc ttgtaagccg actgaaatgt aa 522

<210> 1466

<211> 173

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1466

Met Lys Leu Leu Val Pro Leu Ile Met Pro Ala Met Asp Leu Ile Leu
 . 1 5 10 15

Phe Ala Ala Lys Pro Ser Arg Arg Ala Leu Met Ile Gly Ile Pro Pro

| | | |
|---|-----|-----|
| 20 | 25 | 30 |
| Ala Thr Ala Ala Ser Asn Trp Thr Met Thr Phe Cys Phe Ser Ala Ser | | |
| 35 | 40 | 45 |
| Gly Lys Ile Ser Leu Pro Tyr Ser Ala Ser Ser Phe Leu Leu Ala Val | | |
| 50 | 55 | 60 |
| Thr Met Cys Leu Pro Phe Ser Met Ala Phe Asn Thr Ala Ser Leu Ala | | |
| 65 | 70 | 75 |
| Met Pro Val Pro Pro Asn Asn Ser Thr Thr Thr Ser Thr Ser Leu Arg | | |
| 85 | 90 | 95 |
| Ala Thr Ser Ser Asn Gly Ser Leu Thr Lys Ala Ala Asp Gly Gln Ile | | |
| 100 | 105 | 110 |
| Trp Arg Ala Phe Ser Ser Leu Lys Ser His Met Ala Glu Ile Arg Ile | | |
| 115 | 120 | 125 |
| Ser Arg Pro Lys Arg Arg Glu Ile Ser Ser Ala Leu Ser Arg Asn Thr | | |
| 130 | 135 | 140 |
| Ala Ala Ala Pro Pro Pro Thr Val Pro Lys Pro Lys Arg Pro Met Phe | | |
| 145 | 150 | 155 |
| Thr Gly Phe Ile Val Ser Pro Cys Lys Pro Thr Glu Met | | |
| 165 | 170 | |

<210> 1467
 <211> 522
 <212> DNA
 <213> Neisseria meningitidis

<400> 1467
 atgaagttgc tgggtgccgtt aataatgccg gcgatggatt taatcctggt tgccgccaaa 60
 ccttcgcgca gggctttgat gattgggata ccgcccgcta ctgccgcttc aaattggacg 120
 atgacgtttt gtttttccgc cagcgggaag atttcgttgc cgtattcggc gagcagtttt 180
 ttgttggcgg taacgatgtg ttgcccgttt tcaatggctt tcaacaccgc atctttggca 240
 atgccggtac cgccgaacaa ttcgacgacg acatcgacgt cttcacgtgc gaccagttcg 300
 aacggatctt tgacaaaggc tgcggacggg caggtttgtc gggctttttc ttcaactcaa 360
 tcgcacacgg cagaaatacg gatttcgcgc cccaagcgac gggaaatttc ctccgcgttg 420
 tcccgaaca cggcagccgt accgccgccg accgtaccca aacctaag accgatgttt 480
 actggcttca ttgtgtctcc ttgtaagccg actgaaatgt aa 522

<210> 1468
 <211> 173
 <212> PRT
 <213> Neisseria meningitidis

<400> 1468
 Met Lys Leu Leu Val Pro Leu Ile Met Pro Ala Met Asp Leu Ile Leu
 1 5 10 15

Phe Ala Ala Lys Pro Ser Arg Arg Ala Leu Met Ile Gly Ile Pro Pro
 20 25 30
 Ala Thr Ala Ala Ser Asn Trp Thr Met Thr Phe Cys Phe Ser Ala Ser
 35 40 45
 Gly Lys Ile Ser Leu Pro Tyr Ser Ala Ser Ser Phe Leu Leu Ala Val
 50 55 60
 Thr Met Cys Leu Pro Phe Ser Met Ala Phe Asn Thr Ala Ser Leu Ala
 65 70 75 80
 Met Pro Val Pro Pro Asn Asn Ser Thr Thr Thr Ser Thr Ser Ser Arg
 85 90 95
 Ala Thr Ser Ser Asn Gly Ser Leu Thr Lys Ala Ala Asp Gly Gln Val
 100 105 110
 Cys Arg Ala Phe Ser Ser Leu Lys Ser His Thr Ala Glu Ile Arg Ile
 115 120 125
 Ser Arg Pro Lys Arg Arg Glu Ile Ser Ser Ala Leu Ser Arg Asn Thr
 130 135 140
 Ala Ala Val Pro Pro Pro Thr Val Pro Lys Pro Lys Arg Pro Met Phe
 145 150 155 160
 Thr Gly Phe Ile Val Ser Pro Cys Lys Pro Thr Glu Met
 165 170

<210> 1469
 <211> 522
 <212> DNA
 <213> Neisseria meningitidis

<400> 1469
 atgaagttgc tgggtgccgtt aataatgccg gcgatggatt taatcctggt tgccgccaaa 60
 ccttcgcgca gggctttgat gattgggata ccgcccgcta ctgccgcttc aaattggacg 120
 atgacgtttt gtttttccgc cagcgggaag atttcgttgc cgtattcggc gagcagtttt 180
 ttgtttggcg taacgatgtg tttgccgttt tcaatggctt tcaacaccgc atctttggca 240
 atgccggtac cgccgaacaa ttcgacgacg acatcgacgt cttcacgtgc gaccagttcg 300
 aacggatctt tgacaaaggc tgcggacggg caggtttgtc gggctttttc ttcactcaaa 360
 tcgcacacgg cagaaatacg gatttcgcgc cccaagcgac gggaaatttc ctccgcgttg 420
 tcccgaaca cggcagccgt accgccgccg accgtaccca aacctaaaag accgatgttt 480
 actggcttca ttgtgtctcc ttgtaagccg actgaaatgt aa 522

<210> 1470
 <211> 173
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1470
 Met Lys Leu Leu Val Pro Leu Ile Met Pro Ala Met Asp Leu Ile Leu
 1 5 10 15

Phe Ala Ala Lys Pro Ser Arg Arg Ala Leu Met Ile Gly Ile Pro Pro
 20 25 30
 Ala Thr Ala Ala Ser Asn Trp Thr Met Thr Phe Cys Phe Ser Ala Ser
 35 40 45
 Gly Lys Ile Ser Leu Pro Tyr Ser Ala Ser Ser Phe Leu Leu Ala Val
 50 55 60
 Thr Met Cys Leu Pro Phe Ser Met Ala Phe Asn Thr Ala Ser Leu Ala
 65 70 75 80
 Met Pro Val Pro Pro Asn Asn Ser Thr Thr Thr Ser Thr Ser Ser Arg
 85 90 95
 Ala Thr Ser Ser Asn Gly Ser Leu Thr Lys Ala Ala Asp Gly Gln Val
 100 105 110
 Cys Arg Ala Phe Ser Ser Leu Lys Ser His Thr Ala Glu Ile Arg Ile
 115 120 125
 Ser Arg Pro Lys Arg Arg Glu Ile Ser Ser Ala Leu Ser Arg Asn Thr
 130 135 140
 Ala Ala Val Pro Pro Pro Thr Val Pro Lys Pro Lys Arg Pro Met Phe
 145 150 155 160
 Thr Gly Phe Ile Val Ser Pro Cys Lys Pro Thr Glu Met
 165 170

<210> 1471
 <211> 513
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1471
 atgaaatcaa aactcccctt aatcctaatac aacctttccc tgattttcaag cccattgggt 60
 gcgaatgcgg ccaaaatcta tacctgcaca atcaacggag aaaccgttta caccaccaag 120
 ccgtctaaaa gctgccactc aaccgatttg cccccaatcg gcaactacag cagcgaacgc 180
 tatatcctgc cccaaactcc cgaaccggca ccatcaccgt caaacggcgg acaggctgtc 240
 aaatataaag ccccgggtcaa aacagtatcc aagccggcaa aatccaatac gccgcctcaa 300
 caagcacctg taaataacag cagacgctcc attctcgaag cagaattaag caatgaacgc 360
 aaagccctga ctgaagccca aaaaatgtta tcacaagcac gtctggcaaa aggcggcaac 420
 atcaaccatc aaaaaatcaa cgcattgtta agcaatgttt tggacagaca gcaaaatatc 480
 caagcactgc aaagagaatt gggacgtatg taa 513

<210> 1472
 <211> 169
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1472
 Met Lys Ser Lys Leu Pro Leu Ile Leu Ile Asn Leu Ser Leu Ile Ser
 1 5 10 15

Ser Pro Leu Gly Ala Asn Ala Ala Lys Ile Tyr Thr Cys Thr Ile Asn
 20 25 30
 Gly Glu Thr Val Tyr Thr Thr Lys Pro Ser Lys Ser Cys His Ser Thr
 35 40 45
 Asp Leu Pro Pro Ile Gly Asn Tyr Ser Ser Glu Arg Tyr Ile Leu Pro
 50 55 60
 Gln Thr Pro Glu Pro Ala Pro Ser Pro Ser Asn Gly Gly Gln Ala Val
 65 70 75 80
 Lys Tyr Lys Ala Pro Val Lys Thr Val Ser Lys Pro Ala Lys Ser Asn
 85 90 95
 Thr Pro Pro Gln Gln Ala Pro Val Asn Asn Ser Arg Arg Ser Ile Leu
 100 105 110
 Glu Ala Glu Leu Ser Asn Glu Arg Lys Ala Leu Thr Glu Ala Gln Lys
 115 120 125
 Met Leu Ser Gln Ala Arg Leu Ala Lys Gly Gly Asn Ile Asn His Gln
 130 135 140
 Lys Ile Asn Ala Leu Ser Asn Val Leu Asp Arg Gln Gln Asn Ile Gln
 145 150 155 160
 Ala Leu Gln Arg Glu Leu Gly Arg Met
 165

<210> 1473
 <211> 516
 <212> DNA
 <213> Neisseria meningitidis

<400> 1473
 atgaaatcaa aactcctctt aatcctaata aacttttccc tgatttcaag cccattgggt 60
 gcgaatgcgg ccaaaatcta sacctgcaca atcaacggag aaaccgttta caccascaag 120
 ccgtccaaaa gctgccactc aaccgatttg cccccaatcg gcaactacag cagcgaacgc 180
 tatatccgcg cccaaacgcc cgaaccggta tcatcaccgt caaacggcgg acwggttgtc 240
 aaatataaag ccccggtcaa aacagtatcc aagccggcaa aatccartac gccgccgccg 300
 caacaagcac cctcaaacia cagcagacgc tccattctcg aaacagaatt gagcaacgaa 360
 cgcaaagcat tggttgaagc ccaaaaaatg ttatcacaag cacgtctggc aaagggcggc 420
 aacatcaacc atcaagaaat aaatgcatta caaagcaatg tattggacag gcagcaaaat 480
 attcaagccc tgcaaaggga actggggcgt atgtaa 516

<210> 1474
 <211> 171
 <212> PRT
 <213> Neisseria meningitidis

<400> 1474
 Met Lys Ser Lys Leu Leu Leu Ile Leu Ile Asn Phe Ser Leu Ile Ser
 1 5 10 15

Ser Pro Leu Gly Ala Asn Ala Ala Lys Ile Xaa Thr Cys Thr Ile Asn
 20 25 30
 Gly Glu Thr Val Tyr Thr Xaa Lys Pro Ser Lys Ser Cys His Ser Thr
 35 40 45
 Asp Leu Pro Pro Ile Gly Asn Tyr Ser Ser Glu Arg Tyr Ile Pro Pro
 50 55 60
 Gln Thr Pro Glu Pro Val Ser Ser Pro Ser Asn Gly Gly Xaa Val Val
 65 70 75 80
 Lys Tyr Lys Ala Pro Val Lys Thr Val Ser Lys Pro Ala Lys Ser Xaa
 85 90 95
 Thr Pro Pro Pro Gln Gln Ala Pro Ser Asn Asn Ser Arg Arg Ser Ile
 100 105 110
 Leu Glu Thr Glu Leu Ser Asn Glu Arg Lys Ala Leu Val Glu Ala Gln
 115 120 125
 Lys Met Leu Ser Gln Ala Arg Leu Ala Lys Gly Gly Asn Ile Asn His
 130 135 140
 Gln Glu Ile Asn Ala Leu Gln Ser Asn Val Leu Asp Arg Gln Gln Asn
 145 150 155 160
 Ile Gln Ala Leu Gln Arg Glu Leu Gly Arg Met
 165 170

<210> 1475
 <211> 516
 <212> DNA
 <213> Neisseria meningitidis

<400> 1475
 atgaaatcaa aactcccctt aatcctaatac aacttttccc tgatttcaag cccattgggt 60
 gcgaatgagg ccaaaatcta cacctgcaca atcaacggag aaaccgttta caccaccaag 120
 ccgtccaaaa gctgcctctc aaccgatttg cccccaatcg gcaactacag cagcgaacgc 180
 tatatccgcg cccaaacatc cgaaccgaca ccatcacctg caaacggcgg acaggctgtc 240
 aaatataaag ccccggtcaa aacagtatcc aagccggcaa aatccaatac gccgccgccg 300
 caacaagcac cctcaaacia cagcagacgc tccattctcg aaacagaatt gagcaacgaa 360
 cgcaaagcat tggttgaagc ccaaaaaatg ttatcacaag cacgtctggc aaaaggcggc 420
 aacatcaacc atcaagaaat caacgcattg caaagcaatg tattggacag gcagcaaaat 480
 atccaagcac tgcaaagaga attgggacgt atgtaa 516

<210> 1476
 <211> 170
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1476
 Met Lys Ser Lys Leu Pro Leu Ile Leu Ile Asn Phe Ser Leu Ile Ser

| | | | |
|---|-----|-----|-----|
| 1 | 5 | 10 | 15 |
| Ser Pro Leu Gly Ala Asn Ala Ala Lys Ile Tyr Thr Cys Thr Ile Asn | | | |
| 20 | 25 | 30 | |
| Gly Glu Thr Val Tyr Thr Thr Lys Pro Ser Lys Ser Cys Leu Ser Thr | | | |
| 35 | 40 | 45 | |
| Asp Leu Pro Pro Ile Gly Asn Tyr Ser Ser Glu Arg Tyr Ile Pro Pro | | | |
| 50 | 55 | 60 | |
| Gln Thr Ser Glu Pro Thr Pro Ser Pro Ser Asn Gly Gly Gln Ala Val | | | |
| 65 | 70 | 75 | 80 |
| Lys Tyr Lys Ala Pro Val Lys Thr Val Ser Lys Pro Ala Lys Ser Asn | | | |
| 85 | 90 | 95 | |
| Thr Pro Pro Pro Gln Gln Ala Pro Ser Asn Asn Ser Arg Arg Ser Ile | | | |
| 100 | 105 | 110 | |
| Leu Glu Thr Glu Leu Ser Asn Glu Arg Lys Ala Leu Val Glu Ala Gln | | | |
| 115 | 120 | 125 | |
| Lys Met Leu Ser Gln Ala Arg Leu Ala Lys Gly Gly Asn Ile Asn His | | | |
| 130 | 135 | 140 | |
| Gln Glu Ile Asn Ala Leu Gln Ser Val Leu Asp Arg Gln Gln Asn Ile | | | |
| 145 | 150 | 155 | 160 |
| Gln Ala Leu Gln Arg Glu Leu Gly Arg Met | | | |
| 165 | 170 | | |

<210> 1477
 <211> 435
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1477
 atgactgagc cgaaacacga aacgccgacg gaagagcagg ttgccgcgcg caaaaaagca 60
 aaagccaaaa tccgcacccat ccgcatttgg gcgtgggtca ttttggcggt gctcgcttca 120
 accgccctgc tctcccaatg cgcgatgtcc aaaccgcagg caaaacagaa aattgtcgag 180
 tcttgcataa aaaatattcc gtttgcgtga aaatggcaga acgatttgaa agcgcgcggc 240
 ttggatgagg acaataaccg tctcgccgtc gactactgca aatgtatgtg ggagcagcct 300
 ttggacggat tgagcgagaa acagatcagc tccttcggca aactcgggtg acaagaacag 360
 cttgacctgc tcggcggcgc aaacgcgttt gaaactcgag acaacaatg tgtcgcggat 420
 ttgaaagccg attga 435

<210> 1478
 <211> 144
 <212> PRT
 <213> Neisseria meningitidis

<400> 1478
 Met Thr Glu Pro Lys His Glu Thr Pro Thr Glu Glu Gln Val Ala Ala
 1 5 10 15

Arg Lys Lys Ala Lys Ala Lys Ile Arg Thr Ile Arg Ile Trp Ala Trp
 20 25 30
 Val Ile Leu Ala Leu Leu Ala Ser Thr Ala Leu Leu Ser Gln Cys Ala
 35 40 45
 Met Ser Lys Pro Gln Ala Lys Gln Lys Ile Val Glu Ser Cys Met Lys
 50 55 60
 Asn Ile Pro Phe Ala Glu Lys Trp Gln Asn Asp Leu Lys Ala Arg Gly
 65 70 75 80
 Leu Asp Ala Asp Asn Thr Arg Leu Ala Val Asp Tyr Cys Lys Cys Met
 85 90 95
 Trp Glu Gln Pro Leu Asp Gly Leu Ser Glu Lys Gln Ile Ser Ser Phe
 100 105 110
 Gly Lys Leu Gly Ala Gln Glu Gln Leu Asp Leu Leu Gly Gly Ala Asn
 115 120 125
 Ala Phe Glu Thr Arg Asp Lys Gln Cys Val Ala Asp Leu Lys Ala Asp
 130 135 140

<210> 1479
 <211> 435
 <212> DNA
 <213> Neisseria meningitidis

<400> 1479
 atgactgagc cgaaacacga aatgctgacg aaagagcagg ttgccgcgcg caaaaaagca 60
 aaagccaaaa tccgcacccat ccgcatttgg gcgtgggtca ttttgccggt gctcgcttta 120
 accgccctgc tctcccaatg cgcgatgtcc aaaccgcagg caaaacagaa aattgtcgag 180
 tcttgctgga agaataattcc gtttgccgaa aaatggcaaa acgatttgcg ggcccgcggt 240
 ttagattcaa acaatacccg cctcgccgtc gactactgca aatgtatgtg ggagcagcct 300
 ttgacagat tgagcgagaa acagattaga tccttcggca aactcggcgc acaagaacag 360
 cttgacctgc tcggcggcgc aaatgccttt gaagcacgtg acaagcagtg tgttgccgat 420
 ttgaaatcag aataa 435

<210> 1480
 <211> 144
 <212> PRT
 <213> Neisseria meningitidis

<400> 1480
 Met Thr Glu Pro Lys His Glu Met Leu Thr Lys Glu Gln Val Ala Ala
 1 5 10 15
 Arg Lys Lys Ala Lys Ala Lys Ile Arg Thr Ile Arg Ile Trp Ala Trp
 20 25 30

Val Ile Leu Ala Leu Leu Ala Leu Thr Ala Leu Leu Ser Gln Cys Ala
35 40 45

Met Ser Lys Pro Gln Ala Lys Gln Lys Ile Val Glu Ser Cys Val Lys
50 55 60

Asn Ile Pro Phe Ala Glu Lys Trp Gln Asn Asp Leu Arg Ala Arg Gly
65 70 75 80

Leu Asp Ser Asn Asn Thr Arg Leu Ala Val Asp Tyr Cys Lys Cys Met
85 90 95

Trp Glu Gln Pro Leu Asp Arg Leu Ser Glu Lys Gln Ile Arg Ser Phe
100 105 110

Gly Lys Leu Gly Ala Gln Glu Gln Leu Asp Leu Leu Gly Gly Ala Asn
115 120 125

Ala Phe Glu Ala Arg Asp Lys Gln Cys Val Ala Asp Leu Lys Ser Glu
130 135 140

<210> 1481
<211> 435
<212> DNA
<213> Neisseria meningitidis

<400> 1481
atgactgagc cgaaacacga aatgccgacg gaagagcagg ttgccgcgcg caaaaaagca 60
aaagccaaaa tccgcacat cgcatttgg gcatgggtca ttttggcgtt gctcgttca 120
accgccctgc tctccaatg cgcgatgtcc aaaccgcagg caaacagaa aattgtcgag 180
tcttgcggtga agaattattcc gtttgccgaa aaatggcaaaa acgatttgcg ggcccgcggt 240
ttagattcaa acaatacccg ccttaccgtc gactactgca aatgtatgtg ggagcagcct 300
ttggacagat tgagcgagaa acagattagt tccttcggca aactcggcgc acaagaacag 360
cttgacctgc tcggcggcgc aaatgccttt gaaacgcgag acaagcagtg tgttgccgat 420
ttgaaatcag aataa 435

<210> 1482
<211> 144
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1482
Met Thr Glu Pro Lys His Glu Met Pro Thr Glu Glu Gln Val Ala Ala
1 5 10 15

Arg Lys Lys Ala Lys Ala Lys Ile Arg Thr Ile Arg Ile Trp Ala Trp
20 25 30

Val Ile Leu Ala Leu Leu Ala Ser Thr Ala Leu Leu Ser Gln Cys Ala
35 40 45

Met Ser Lys Pro Gln Ala Lys Gln Lys Ile Val Glu Ser Cys Val Lys

Gly Lys Tyr Ala Glu Ile Leu Arg Tyr Thr Gly Gly Asn Arg Tyr Glu
85 90 95

Val Phe Tyr Arg Gly Thr His Trp Gln Ala Gln Asn Thr Gly Gln Glu
100 105 110

Val Phe Glu Pro Gly Thr Arg Ala Leu Ile Val Arg Lys Glu Gly Asn
115 120 125

Leu Leu Ile Ile Ala Asn Pro
130 135

<210> 1485
<211> 381
<212> DNA
<213> Neisseria meningitidis

<400> 1485
gccgtcttaa tcacgaatt attgacggga acggtttatc ttttggttgt nagcgcggt 60
ttggcggtt cgggcattgc ttacgggctg accggcagta cgctgcccgc cgtcttgacc 120
gncgctctgc ttccgcgct gggtatttng ttcgtacacg ccaaaaccgc cgtagaaaa 180
gttgaaacgg attcatatca ggatttggat gccggacaat atgtcgaaat cctccgacac 240
acaggcggca accgttacga agttttttat cgcggtacgc actggcaggc tcaaaatacg 300
gggcaagaag agcttgaacc aggaactcgc gccctcattg tccgcaagga aggcaacctt 360
cttattatca cacaccctta a 381

<210> 1486
<211> 126
<212> PRT
<213> Neisseria meningitidis

<400> 1486
Ala Val Leu Ile Ile Glu Leu Leu Thr Gly Thr Val Tyr Leu Leu Val
1 5 10 15

Val Ser Ala Ala Leu Ala Gly Ser Gly Ile Ala Tyr Gly Leu Thr Gly
20 25 30

Ser Thr Pro Ala Ala Val Leu Thr Xaa Ala Leu Leu Ser Ala Leu Gly
35 40 45

Ile Xaa Phe Val His Ala Lys Thr Ala Val Arg Lys Val Glu Thr Asp
50 55 60

Ser Tyr Gln Asp Leu Asp Ala Gly Gln Tyr Val Glu Ile Leu Arg His
65 70 75 80

Thr Gly Gly Asn Arg Tyr Glu Val Phe Tyr Arg Gly Thr His Trp Gln
85 90 95

Ala Gln Asn Thr Gly Gln Glu Glu Leu Glu Pro Gly Thr Arg Ala Leu
100 105 110

Ile Val Arg Lys Glu Gly Asn Leu Leu Ile Ile Thr His Pro

115

120

125

<210> 1487

<211> 408

<212> DNA

<213> *Neisseria meningitidis*

<400> 1487

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gtttatcttt tggttgtcag cgcggctttg gcgggttcgg gcattgctta cgggctgacc 120
ggcagcacgc ctgccgccgt cttgaccgcc gctctgcttt ccgcgctggg tatttggttc 180
gtacacgcca aaaccgccgt gggaaaagtt gaaacggatt catatcagga tttggatgcc 240
gggcaatatg ccgaaatcct ccggcacgca ggcggcaacc gttacgaagt tttttatcgc 300
ggtacgcact ggcaggctca aaatacgggg caagaagagc ttgaaccagg aacgcgcgcc 360
ctaatacgctc gcaaggaagg caaccttctt atcatcgcaa aaccttaa 408

```

<210> 1488

<211> 135

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1488

```

Met Thr Val Trp Phe Val Ala Ala Val Ala Val Leu Ile Ile Glu Leu
  1             5             10             15

```

```

Leu Thr Gly Thr Val Tyr Leu Leu Val Val Ser Ala Ala Leu Ala Gly
          20             25             30

```

```

Ser Gly Ile Ala Tyr Gly Leu Thr Gly Ser Thr Pro Ala Ala Val Leu
          35             40             45

```

```

Thr Ala Ala Leu Leu Ser Ala Leu Gly Ile Trp Phe Val His Ala Lys
          50             55             60

```

```

Thr Ala Val Gly Lys Val Glu Thr Asp Ser Tyr Gln Asp Leu Asp Ala
          65             70             75             80

```

```

Gly Gln Tyr Ala Glu Ile Leu Arg His Ala Gly Gly Asn Arg Tyr Glu
          85             90             95

```

```

Val Phe Tyr Arg Gly Thr His Trp Gln Ala Gln Asn Thr Gly Gln Glu
          100            105            110

```

```

Glu Leu Glu Pro Gly Thr Arg Ala Leu Ile Val Arg Lys Glu Gly Asn
          115            120            125

```

```

Leu Leu Ile Ile Ala Lys Pro
          130            135

```

<210> 1489

<211> 561

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1489

```
atgaagtacg tccggttatt tttcctcggc acggcactcg ccggcactca agcggcgggt 60
gccgaaatgg ttcaaatacg aggcggcagc taccgcccgc tttatctgaa aaaagatacc 120
ggcctgatta aagtcaaacc gttcaaactg gataaatatc ccgttaccaa tgccgagttt 180
gccgaatttg tcaacagcca cccccaatgg caaaaaggca ggatcgggtc caaacaggca 240
gaacccgctt acctgaagca ttggatgaaa aacggcagcc gcagctatgc gccgaaggcg 300
ggcgaattga aacagccggt taccaatatt tcctggtttg ccgccaacgc ctattgcgcc 360
gcacaaggca aacgcctgcc gaccatcgac gaatgggaat ttgccggact tgcttccgcc 420
acgcagaaaa aacggctcaa acgaaccggg ctacaaccgc actattctcg attggtatgc 480
cgacggcgga cggaaaggcc tgcacgatgt cggcaaagca ccgcccgaac tactggggtg 540
tttatgatat gcacgggctg a 561
```

<210> 1490

<211> 186

<212> PRT

<213> Neisseria meningitidis

<400> 1490

```
Met Lys Tyr Val Arg Leu Phe Phe Leu Gly Thr Ala Leu Ala Gly Thr
  1             5             10             15

Gln Ala Ala Ala Ala Glu Met Val Gln Ile Glu Gly Gly Ser Tyr Arg
      20             25             30

Pro Leu Tyr Leu Lys Lys Asp Thr Gly Leu Ile Lys Val Lys Pro Phe
      35             40             45

Lys Leu Asp Lys Tyr Pro Val Thr Asn Ala Glu Phe Ala Glu Phe Val
      50             55             60

Asn Ser His Pro Gln Trp Gln Lys Gly Arg Ile Gly Ser Lys Gln Ala
      65             70             75             80

Glu Pro Ala Tyr Leu Lys His Trp Met Lys Asn Gly Ser Arg Ser Tyr
      85             90             95

Ala Pro Lys Ala Gly Glu Leu Lys Gln Pro Val Thr Asn Ile Ser Trp
      100            105            110

Phe Ala Ala Asn Ala Tyr Cys Ala Ala Gln Gly Lys Arg Leu Pro Thr
      115            120            125

Ile Asp Glu Trp Glu Phe Ala Gly Leu Ala Ser Ala Thr Gln Lys Lys
      130            135            140

Arg Leu Lys Arg Thr Arg Leu Gln Pro His Tyr Ser Arg Leu Val Cys
      145            150            155            160

Arg Arg Arg Thr Glu Arg Pro Ala Arg Cys Arg Gln Ser Thr Ala Arg
      165            170            175

Thr Thr Gly Val Phe Met Ile Cys Thr Gly
      180            185
```


<210> 1491
 <211> 559
 <212> DNA
 <213> Neisseria meningitidis

<400> 1491
 atgaagtatg tccggttatt ttwcctcggc gcggcactcg cccrcactca arcggcggt 60
 gccgaaatgg ttcaaatacg aggcggcagc taccgcccrc tttatctgaa aaaagatacc 120
 ggcttgatta aagtcaaacc gttcaaactg gataaatatc ccgttaccaa tgccgagttt 180
 gccgaatttg tcaacagcca cccccaatgg caaaaaggca ggatcggttc caaacaggca 240
 gaacccgctt acctgaagca ttggatgaaa aacggcagcc gcagctatgc gccgaaggcg 300
 ggcgaattaa aacaaccggt aaccaatgtt tcctggwtg ccgccaacgc ctattgcgcc 360
 gcacaaggca aacgcctgcc gaccattgac gaatgggaat ttgccggact tgcttccgcc 420
 acgcagaaaa acggctcaaa cgaacccggc tacaaccgca ctattctcga ttggtatgcc 480
 gacggcggac ggaaaggcct gcacgatgtc ggcaaaggcc gcccgacta ctggggcggt 540
 tatgatatgc acgggctga 559

<210> 1492
 <211> 186
 <212> PRT
 <213> Neisseria meningitidis

<400> 1492
 Met Lys Tyr Val Arg Leu Phe Xaa Leu Gly Ala Ala Leu Ala Xaa Thr
 1 5 10 15
 Gln Xaa Ala Ala Ala Glu Met Val Gln Ile Glu Gly Gly Ser Tyr Arg
 20 25 30
 Pro Leu Tyr Leu Lys Lys Asp Thr Gly Leu Ile Lys Val Lys Pro Phe
 35 40 45
 Lys Leu Asp Lys Tyr Pro Val Thr Asn Ala Glu Phe Ala Glu Phe Val
 50 55 60
 Asn Ser His Pro Gln Trp Gln Lys Gly Arg Ile Gly Ser Lys Gln Ala
 65 70 75 80
 Glu Pro Ala Tyr Leu Lys His Trp Met Lys Asn Gly Ser Arg Ser Tyr
 85 90 95
 Ala Pro Lys Ala Gly Glu Leu Lys Gln Pro Val Thr Asn Val Ser Trp
 100 105 110
 Xaa Ala Ala Asn Ala Tyr Cys Ala Ala Gln Gly Lys Arg Leu Pro Thr
 115 120 125
 Ile Asp Glu Trp Glu Phe Ala Gly Leu Ala Ser Ala Thr Gln Lys Xaa
 130 135 140
 Arg Leu Lys Arg Thr Arg Leu Gln Pro His Tyr Ser Arg Leu Val Cys
 145 150 155 160
 Arg Arg Arg Thr Glu Arg Pro Ala Arg Cys Arg Xaa Lys Ala Ala Arg
 165 170 175

Thr Thr Gly Ala Phe Met Ile Cys Thr Gly
180 185

<210> 1493
<211> 559
<212> DNA
<213> Neisseria meningitidis

<400> 1493
atgaagttta cccggttact ctttctctgt gcggcactcg ccggcactca agcggcagct 60
gccgaaatgg ttcaaatcga aggcggcagc taccgcccgc tttatctgaa aaaagatacc 120
ggcctgatta aagtcaaacc gttcaaactg gataaatatc ccgttaccaa tgccgagttt 180
gccgaatttg tcaacagcca cccccaatgg caaaaaggca ggatcggttc caaacaggca 240
gaacccgctt acctgaagca ttggatgaaa aacggcagcc gcagctatgc gccgaaggcg 300
ggcgatttaa aacaaccggt aaccaatggt tccctggttcg ccgccaacgc ctattgcgcc 360
gcacaaggca aacgcctgcc gaccattgac gaatgggaat ttgccggact tgcctccgcc 420
acgcagaaaa acggtcmeta cgaaccggc tacaaccgca ctattctcga ctggtatgcg 480
gatggcgacc ggaaagacct gcacgatgtc ggcaaaggtc gcccgacta ctggggcgctt 540
tatgatatgc acggtctga 559

<210> 1494
<211> 186
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1494
Met Lys Phe Thr Arg Leu Leu Phe Leu Cys Ala Ala Leu Ala Gly Thr
1 5 10 15
Gln Ala Ala Ala Ala Glu Met Val Gln Ile Glu Gly Gly Ser Tyr Arg
20 25 30
Pro Leu Tyr Leu Lys Lys Asp Thr Gly Leu Ile Lys Val Lys Pro Phe
35 40 45
Lys Leu Asp Lys Tyr Pro Val Thr Asn Ala Glu Phe Ala Glu Phe Val
50 55 60
Asn Ser His Pro Gln Trp Gln Lys Gly Arg Ile Gly Ser Lys Gln Ala
65 70 75 80
Glu Pro Ala Tyr Leu Lys His Trp Met Lys Asn Gly Ser Arg Ser Tyr
85 90 95
Ala Pro Lys Ala Gly Asp Leu Lys Gln Pro Val Thr Asn Val Ser Trp
100 105 110
Phe Ala Ala Asn Ala Tyr Cys Ala Ala Gln Gly Lys Arg Leu Pro Thr
115 120 125
Ile Asp Glu Trp Glu Phe Ala Gly Leu Ala Ser Ala Thr Gln Xaa Lys
130 135 140

Arg Leu Lys Arg Thr Arg Leu Gln Pro His Tyr Ser Arg Leu Val Cys
 145 150 155 160

Gly Trp Arg Pro Glu Arg Pro Ala Arg Cys Arg Gln Xaa Val Ala Arg
 165 170 175

Thr Thr Gly Ala Phe Met Ile Cys Thr Val
 180 185

<210> 1495

<211> 756

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1495

```
atgaagtacg tccggttatt tttcctcggc acggcactcg ccggcactca agcggcggct 60
gccgaaatgg ttcaaactga aggcggcagc taccgcccgc tttatctgaa aaaagatacc 120
ggcctgatta aagtcaaacc gttcaaactg gataaatatc ccgttaccac tgccgagttt 180
gccgaatttg tcaacagcca cccccaatgg caaaaaggca ggatcgggttc caaacaggca 240
gaacccgctt acctgaagca ttggatgaaa aacggcagcc gcagctatgc gccgaaggcg 300
ggcgaattga aacagccggt taccaatatt tcctggtttg ccgccaaagc ctattgcgcc 360
gcacaaggca aacgcctgcc gaccatcgac gaatgggaat ttgccggact tgcttcgcc 420
acgcagaaaa acggctcaaa cgaacccggc tacaaccgca ctattctcga ttggtatgcc 480
gacggcggac ggaaaggcct gcacgatgtc ggcaaagacc gcccgaaacta ctgggggtgtt 540
tatgatatgc acgggctgat ttgggaatgg acggaagatt tcaacagcag cctgctttct 600
tccggcaatg ccaacgcgca aatgttttgc agcggcgcac ctgtcggggc gagcgactcg 660
tccaactatg ccgccttcct ccgctacggc atccgcacca gcctgcaatc caaatacgtc 720
ctgcacaact tgggcttccg ctgcgcaagc cgataa 756
```

<210> 1496

<211> 251

<212> PRT

<213> Neisseria meningitidis

<400> 1496

Met Lys Tyr Val Arg Leu Phe Phe Leu Gly Thr Ala Leu Ala Gly Thr
 1 5 10 15

Gln Ala Ala Ala Ala Glu Met Val Gln Ile Glu Gly Gly Ser Tyr Arg
 20 25 30

Pro Leu Tyr Leu Lys Lys Asp Thr Gly Leu Ile Lys Val Lys Pro Phe
 35 40 45

Lys Leu Asp Lys Tyr Pro Val Thr Asn Ala Glu Phe Ala Glu Phe Val
 50 55 60

Asn Ser His Pro Gln Trp Gln Lys Gly Arg Ile Gly Ser Lys Gln Ala
 65 70 75 80

Glu Pro Ala Tyr Leu Lys His Trp Met Lys Asn Gly Ser Arg Ser Tyr
 85 90 95

Ala Pro Lys Ala Gly Glu Leu Lys Gln Pro Val Thr Asn Ile Ser Trp
 100 105 110

Phe Ala Ala Asn Ala Tyr Cys Ala Ala Gln Gly Lys Arg Leu Pro Thr
 115 120 125
 Ile Asp Glu Trp Glu Phe Ala Gly Leu Ala Ser Ala Thr Gln Lys Asn
 130 135 140
 Gly Ser Asn Glu Pro Gly Tyr Asn Arg Thr Ile Leu Asp Trp Tyr Ala
 145 150 155 160
 Asp Gly Gly Arg Lys Gly Leu His Asp Val Gly Lys Asp Arg Pro Asn
 165 170 175
 Tyr Trp Gly Val Tyr Asp Met His Gly Leu Ile Trp Glu Trp Thr Glu
 180 185 190
 Asp Phe Asn Ser Ser Leu Leu Ser Ser Gly Asn Ala Asn Ala Gln Met
 195 200 205
 Phe Cys Ser Gly Ala Ser Val Gly Ala Ser Asp Ser Ser Asn Tyr Ala
 210 215 220
 Ala Phe Leu Arg Tyr Gly Ile Arg Thr Ser Leu Gln Ser Lys Tyr Val
 225 230 235 240
 Leu His Asn Leu Gly Phe Arg Cys Ala Ser Arg
 245 250

<210> 1497
 <211> 756
 <212> DNA
 <213> Neisseria meningitidis

<400> 1497
 atgaagtatg tccggttatt tttcctcggc gcggcactcg ccggcactca agcggcggct 60
 gccgaaatgg ttcaaactga aggcggcagc taccgcccgc tttatctgaa aaaagatacc 120
 ggcctgatta aagtcaaacc gttcaaactg gataaatatc ccgttaccaa tgccgagttt 180
 gccgaatttg tcaacagcca ccccaaatgg caaaaaggca ggatcgggtc caaacaggca 240
 gaacccgctt acctgaagca ttggatgaaa aacggcagcc gcagctatgc gccgaaggcg 300
 ggcgaattaa aacaaccggt aaccaatgtt tcctggtttg ccgccaacgc ctattgcgcc 360
 gcacaaggca aacgcctgcc gaccattgac gaatgggaat ttgccggact tgcttcgcc 420
 acgcagaaaa acggctcaaa cgaaccggc tacaaccgca ctattctcga ttggtatgcc 480
 gacggcggac ggaaaggcct gcacgatgtc ggcaaaggcc gccgaacta ctggggcgctt 540
 tatgatatgc acgggctgat ttgggaatgg acggaagatt tcaacagcag cctgctttct 600
 tccggcaatg ccaacgcgca aatgttttgc agcggcgcgt ctatcgggtc gagcgactcg 660
 tccaactatg ccgccttcct ccgctacggc atccgtacca gcctgcaatc caaatatgtc 720
 ttgcacaact tgggcttcgc ttgcacaagc cgataa 756

<210> 1498
 <211> 251
 <212> PRT
 <213> Neisseria meningitidis

<400> 1498
 Met Lys Tyr Val Arg Leu Phe Phe Leu Gly Ala Ala Leu Ala Gly Thr

| | | | |
|---|-----|-----|-----|
| 1 | 5 | 10 | 15 |
| Gln Ala Ala Ala Ala Glu Met Val Gln Ile Glu Gly Gly Ser Tyr Arg | 20 | 25 | 30 |
| Pro Leu Tyr Leu Lys Lys Asp Thr Gly Leu Ile Lys Val Lys Pro Phe | 35 | 40 | 45 |
| Lys Leu Asp Lys Tyr Pro Val Thr Asn Ala Glu Phe Ala Glu Phe Val | 50 | 55 | 60 |
| Asn Ser His Pro Gln Trp Gln Lys Gly Arg Ile Gly Ser Lys Gln Ala | 65 | 70 | 75 |
| Glu Pro Ala Tyr Leu Lys His Trp Met Lys Asn Gly Ser Arg Ser Tyr | 85 | 90 | 95 |
| Ala Pro Lys Ala Gly Glu Leu Lys Gln Pro Val Thr Asn Val Ser Trp | 100 | 105 | 110 |
| Phe Ala Ala Asn Ala Tyr Cys Ala Ala Gln Gly Lys Arg Leu Pro Thr | 115 | 120 | 125 |
| Ile Asp Glu Trp Glu Phe Ala Gly Leu Ala Ser Ala Thr Gln Lys Asn | 130 | 135 | 140 |
| Gly Ser Asn Glu Pro Gly Tyr Asn Arg Thr Ile Leu Asp Trp Tyr Ala | 145 | 150 | 155 |
| Asp Gly Gly Arg Lys Gly Leu His Asp Val Gly Lys Gly Arg Pro Asn | 165 | 170 | 175 |
| Tyr Trp Gly Val Tyr Asp Met His Gly Leu Ile Trp Glu Trp Thr Glu | 180 | 185 | 190 |
| Asp Phe Asn Ser Ser Leu Leu Ser Ser Gly Asn Ala Asn Ala Gln Met | 195 | 200 | 205 |
| Phe Cys Ser Gly Ala Ser Ile Gly Ser Ser Asp Ser Ser Asn Tyr Ala | 210 | 215 | 220 |
| Ala Phe Leu Arg Tyr Gly Ile Arg Thr Ser Leu Gln Ser Lys Tyr Val | 225 | 230 | 235 |
| Leu His Asn Leu Gly Phe Arg Cys Thr Ser Arg | 245 | 250 | |

<210> 1499

<211> 756

<212> DNA

<213> Neisseria meningitidis

<400> 1499

atgaagttta cccggttact ctttctctgt gcggcactcg ccggcactca agcggcagct 60
gccgaaatgg ttcaaactga aggcggcagc taccgcccgc tttatctgaa aaaagatacc 120
ggcctgatta aagtcaaacc gttcaaactg gataaatatc ccgttaccaa tgccgagttt 180

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gccgaatttg tcaacagcca cccccaatgg caaaaaggca ggatcggttc caaacaggca 240
gaacccgctt acctgaagca ttggatgaaa aacggcagcc gcagctatgc gccgaaggcg 300
ggcgatttaa aacaaccggt aaccaatggt tcttggttcg ccgccaacgc ctattgcgcc 360
gcacaaggca aacgcctgcc gaccattgac gaatgggaat ttgccggact tgcctccgcc 420
acgcagaaaa acggctcaaa cgaacccggc tacaaccgca ctattctcga ctggtatgcg 480
gatggcgacc ggaaagacct gcacgatgtc ggcaaaggtc gcccgaaacta ctggggcggt 540
tatgatatgc acggtctgat ttgggaatgg acggaagatt tcaacagcag cctgctttct 600
tccggcaatg ccaacgcgca aatgttttgc agcggcgcggt ctatcgggtc gagcgactcg 660
tccaactatg ccgccttctt ccgctacggc atccgcacca gcctgcaatc caaatatgtc 720
ttgcacaact tgggcttccg ttgcacaagc cgataa 756

```

<210> 1500

<211> 251

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1500

```

Met Lys Phe Thr Arg Leu Leu Phe Leu Cys Ala Ala Leu Ala Gly Thr
  1             5             10             15

Gln Ala Ala Ala Ala Glu Met Val Gln Ile Glu Gly Gly Ser Tyr Arg
      20             25             30

Pro Leu Tyr Leu Lys Lys Asp Thr Gly Leu Ile Lys Val Lys Pro Phe
  35             40             45

Lys Leu Asp Lys Tyr Pro Val Thr Asn Ala Glu Phe Ala Glu Phe Val
  50             55             60

Asn Ser His Pro Gln Trp Gln Lys Gly Arg Ile Gly Ser Lys Gln Ala
  65             70             75             80

Glu Pro Ala Tyr Leu Lys His Trp Met Lys Asn Gly Ser Arg Ser Tyr
      85             90             95

Ala Pro Lys Ala Gly Asp Leu Lys Gln Pro Val Thr Asn Val Ser Trp
    100             105             110

Phe Ala Ala Asn Ala Tyr Cys Ala Ala Gln Gly Lys Arg Leu Pro Thr
    115             120             125

Ile Asp Glu Trp Glu Phe Ala Gly Leu Ala Ser Ala Thr Gln Lys Asn
    130             135             140

Gly Ser Asn Glu Pro Gly Tyr Asn Arg Thr Ile Leu Asp Trp Tyr Ala
    145             150             155             160

Asp Gly Asp Arg Lys Asp Leu His Asp Val Gly Lys Gly Arg Pro Asn
    165             170             175

Tyr Trp Gly Val Tyr Asp Met His Gly Leu Ile Trp Glu Trp Thr Glu
    180             185             190

Asp Phe Asn Ser Ser Leu Leu Ser Ser Gly Asn Ala Asn Ala Gln Met
    195             200             205

```

Phe Cys Ser Gly Ala Ser Ile Gly Ser Ser Asp Ser Ser Asn Tyr Ala
 210 215 220

Ala Phe Leu Arg Tyr Gly Ile Arg Thr Ser Leu Gln Ser Lys Tyr Val
 225 230 235 240

Leu His Asn Leu Gly Phe Arg Cys Thr Ser Arg
 245 250

<210> 1501
 <211> 453
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1501
 atgggttttac cagtctcctt ttttcagcct gtccagttgg cggcgggtcgc gcttggtcgg 60
 tctgccgtcg ggatgggagg aagtgatgcg gctgaattgg tcgagctggt tgcactcttc 120
 cctcaatgct gccgttttcg cgtcttcttc atacagaagc cgcgcctcgg gtgccgggag 180
 gcgttggtgg ttcaaacctt taaccttgat tttatgggga agggaattga gcgtcaggtc 240
 gataatatcg ccgatgtcta tggttttact gtttttgact ttcgagccgt ttacttgaac 300
 cctaccagat tcgatatgct tttgcgcaag ggaacgggtc ttgaaaaaac gtgccgccca 360
 aagccatttg tccagccgca tggcggaaga atcgtgcttg tctttcatac gattttgttt 420
 gaaataattg aatttgtttc gagtttagca taa 453

<210> 1502
 <211> 150
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1502
 Met Val Leu Pro Val Ser Phe Phe Gln Pro Val Gln Leu Ala Ala Val
 1 5 10 15

Ala Leu Gly Arg Ser Ala Val Gly Met Gly Gly Ser Asp Ala Ala Glu
 20 25 30

Leu Val Glu Leu Phe Ala Leu Phe Pro Gln Cys Cys Arg Phe Arg Val
 35 40 45

Phe Phe Ile Gln Lys Pro Arg Leu Gly Cys Arg Ala Ala Leu Val Val
 50 55 60

Gln Thr Phe Asn Leu Asp Phe Met Gly Lys Gly Ile Glu Arg Gln Val
 65 70 75 80

Asp Asn Ile Ala Asp Val Tyr Gly Phe Thr Val Phe Asp Phe Arg Ala
 85 90 95

Val Tyr Leu Asn Pro Thr Gln Phe Asp Met Leu Leu Arg Lys Gly Thr
 100 105 110

Gly Leu Glu Lys Thr Cys Arg Pro Lys Pro Phe Val Gln Pro His Gly
 115 120 125

Gly Arg Ile Val Leu Val Phe His Thr Ile Leu Phe Glu Ile Ile Glu

| | | |
|-------------------------|-----|-----|
| 130 | 135 | 140 |
| Phe Val Ser Ser Leu Ala | | |
| 145 | 150 | |

<210> 1503
 <211> 452
 <212> DNA
 <213> Neisseria meningitidis

<400> 1503
 atggttttac cagtctcctt ttttcagcct gtccagttgg cggcggtcgc gcttggtcgg 60
 tctgccgtcg ggataggcgg aagtgatgcg gctgaattgg tcgagctggt tgcgctcttc 120
 cctcaatggt gccgttwtcg cgtcctcttc atacagaagc cgcgcytcgg atgccgggcg 180
 gcgttggtgg ttcaaacctt taacctgat tttataggga agggaattka gcktcagtyg 240
 rtwatatcgc sgatgtmtat ggttttactg tttttgacct tcgagccggt tacttgaacc 300
 ctacccagtt cgatgtgctt ttgcgcaagg gaacgggtct tgaaaaaacg tgccgcccaa 360
 agccatttgt ccagccgcat ggcggaagaa tcgtgcttgt ctttcatacg atttgtttg 420
 aaataattga atttgtttcg agtttagcat aa 452

<210> 1504
 <211> 150
 <212> PRT
 <213> Neisseria meningitidis

<400> 1504
 Met Val Leu Pro Val Ser Phe Phe Gln Pro Val Gln Leu Ala Ala Val
 1 5 10 15
 Ala Leu Gly Arg Ser Ala Val Gly Ile Gly Gly Ser Asp Ala Ala Glu
 20 25 30
 Leu Val Glu Leu Phe Ala Leu Phe Pro Gln Cys Cys Arg Xaa Arg Val
 35 40 45
 Leu Phe Ile Gln Lys Pro Arg Xaa Gly Cys Arg Ala Ala Leu Val Val
 50 55 60
 Gln Thr Phe Asn Xaa Asp Phe Ile Gly Lys Xaa Asn Xaa Ala Ser Val
 65 70 75 80
 Xaa Xaa Ile Ala Asp Val Tyr Gly Phe Thr Val Phe Asp Leu Arg Ala
 85 90 95
 Val Tyr Leu Asn Pro Thr Gln Phe Asp Val Leu Leu Arg Lys Gly Thr
 100 105 110
 Gly Leu Glu Lys Thr Cys Arg Pro Lys Pro Phe Val Gln Pro His Gly
 115 120 125
 Gly Arg Ile Val Leu Val Phe His Thr Ile Leu Phe Glu Ile Ile Glu
 130 135 140
 Phe Val Ser Ser Leu Ala
 145 150

<210> 1505
 <211> 453
 <212> DNA
 <213> Neisseria meningitidis

<400> 1505
 atggttttac cagtctcctt ttttcagcct gtccagttgg cggcggtcgc gcttggtcgg 60
 tctgccgtcg ggataggcgg aagtgatgcg gctgaattgg tgcagctggt tgcgctcttc 120
 cctcaatggt gccgttttcg cgtcctcttc atacagaagc cgcgcctcgg atgccgggcg 180
 gcggttggtg ttcaaacctt taaccttgat tttataggga agggaattga gcgtcaggtc 240
 gataatatcg ccgatgtcta tggttttact gtttttgacc ttcgagccgt ttacttgaac 300
 cctacccagt tcgatgtgct tttgcgcaag ggaacgggtc ttgaaaaaac gtgccgccca 360
 aagccatttg tccagccgca tggcggaaga atcgtgcttg tctttcatac gattttggtt 420
 gaaataattg aatttgtttc gatttagca taa 453

<210> 1506
 <211> 150
 <212> PRT
 <213> Neisseria meningitidis

<400> 1506
 Met Val Leu Pro Val Ser Phe Phe Gln Pro Val Gln Leu Ala Ala Val
 1 5 10 15
 Ala Leu Gly Arg Ser Ala Val Gly Ile Gly Gly Ser Asp Ala Ala Glu
 20 25 30
 Leu Val Glu Leu Phe Ala Leu Phe Pro Gln Cys Cys Arg Phe Arg Val
 35 40 45
 Leu Phe Ile Gln Lys Pro Arg Leu Gly Cys Arg Ala Ala Leu Val Val
 50 55 60
 Gln Thr Phe Asn Leu Asp Phe Ile Gly Lys Gly Ile Glu Arg Gln Val
 65 70 75 80
 Asp Asn Ile Ala Asp Val Tyr Gly Phe Thr Val Phe Asp Leu Arg Ala
 85 90 95
 Val Tyr Leu Asn Pro Thr Gln Phe Asp Val Leu Leu Arg Lys Gly Thr
 100 105 110
 Gly Leu Glu Lys Thr Cys Arg Pro Lys Pro Phe Val Gln Pro His Gly
 115 120 125
 Gly Arg Ile Val Leu Val Phe His Thr Ile Leu Phe Glu Ile Ile Glu
 130 135 140
 Phe Val Ser Ser Leu Ala
 145 150

<210> 1507
 <211> 408

<212> DNA
<213> *Neisseria gonorrhoeae*

<400> 1507
atggaaattc gggtaataaa atatacggca acggctgcgt tgtttgcatt tacggttgca 60
ggctgccggc tggcggggtg gtatgagtgt ttgtccttgt ccggctgggtg taagccgaga 120
aaacctgccg ccatcgattt ttgggatatt ggcggcgaga gtccgctgtc tttagaggac 180
tacgagatac cgctttcaga cggcaatcgt tccgtcaggg caaacgaata tgaatccgcg 240
caaaaatctt acttttatag gaaaataggg aagtttgaag cctgcggggtt ggattggcgt 300
acgcgtgacg gcaaaccctt ggttgagagg ttcaaacagg aaggtttcga ctgtttggaa 360
aagcaggggt tgcggcgcaa cggcctgtcc gagcgcgtcc gatggtaa 408

<210> 1508
<211> 135
<212> PRT
<213> *Neisseria gonorrhoeae*

<400> 1508
Met Glu Ile Arg Val Ile Lys Tyr Thr Ala Thr Ala Ala Leu Phe Ala
1 5 10 15
Phe Thr Val Ala Gly Cys Arg Leu Ala Gly Trp Tyr Glu Cys Leu Ser
20 25 30
Leu Ser Gly Trp Cys Lys Pro Arg Lys Pro Ala Ala Ile Asp Phe Trp
35 40 45
Asp Ile Gly Gly Glu Ser Pro Leu Ser Leu Glu Asp Tyr Glu Ile Pro
50 55 60
Leu Ser Asp Gly Asn Arg Ser Val Arg Ala Asn Glu Tyr Glu Ser Ala
65 70 75 80
Gln Lys Ser Tyr Phe Tyr Arg Lys Ile Gly Lys Phe Glu Ala Cys Gly
85 90 95
Leu Asp Trp Arg Thr Arg Asp Gly Lys Pro Leu Val Glu Arg Phe Lys
100 105 110
Gln Glu Gly Phe Asp Cys Leu Glu Lys Gln Gly Leu Arg Arg Asn Gly
115 120 125
Leu Ser Glu Arg Val Arg Trp
130 135

<210> 1509
<211> 362
<212> DNA
<213> *Neisseria meningitidis*

<400> 1509
atggaaattc gggcaataaa atatacggca atggctgcgt tgcttgcatt tacggttgca 60
ggctgccggc tggcggggtg gtatgagtgt tcgtccctca ccggctgggtg taagccgaga 120
aaaccggctg ccatcgattt ttgggatatt ggcggcgaga gtccgcgctc tttaggggac 180
tacgagatac cgctttcaga cggcaatagt tccgtcaggg caaacgaata tgaatccgca 240

caacaatctt acttttacag gaaaataggg aagtttgaag ctgcgggctg gattggcgta 300
 cgctgacgg caaacctttg attgagacgt tcaaacaggg aggatttgac tgcttgaaa 360
 ag 362

<210> 1510
 <211> 121
 <212> PRT
 <213> Neisseria meningitidis

<400> 1510
 Met Glu Ile Arg Ala Ile Lys Tyr Thr Ala Met Ala Ala Leu Leu Ala
 1 5 10 15
 Phe Thr Val Ala Gly Cys Arg Leu Ala Gly Trp Tyr Glu Cys Ser Ser
 20 25 30
 Leu Thr Gly Trp Cys Lys Pro Arg Lys Pro Ala Ala Ile Asp Phe Trp
 35 40 45
 Asp Ile Gly Gly Glu Ser Pro Pro Ser Leu Gly Asp Tyr Glu Ile Pro
 50 55 60
 Leu Ser Asp Gly Asn Ser Ser Val Arg Ala Asn Glu Tyr Glu Ser Ala
 65 70 75 80
 Gln Gln Ser Tyr Phe Tyr Arg Lys Ile Gly Lys Phe Glu Xaa Cys Gly
 85 90 95
 Leu Asp Trp Arg Thr Arg Asp Gly Lys Pro Leu Ile Glu Thr Phe Lys
 100 105 110
 Gln Gly Gly Phe Asp Cys Leu Glu Lys
 115 120

<210> 1511
 <211> 408
 <212> DNA
 <213> Neisseria meningitidis

<400> 1511
 atggaaattc gggcaataaa atatacggca atggctgcgt tgcttgcatc tacggttgca 60
 ggctgccggt tggcagggtg gtatgagtgt tcgtccctgt ccggctggtg taagccgaga 120
 aaacctgccg ccatcgattt ttgggatatt ggcggcgaga gtctccgctc tttagaggac 180
 tacgagatac cgctttcaga cggcaatcgt tccgtcaggg caaacgaata tgaatccgca 240
 caacaatctt acttttacag gaaaataggg aagtttgaag cctgcggggt ggattggcgt 300
 acgcgtgacg gcaaaccttt gattgagacg ttcaaacagg aaggttttga ttgtttgaaa 360
 aagcaggggt tgcggcgcaa cggctctgtc gagcgcgtcc gatggtaa 408

<210> 1512
 <211> 135
 <212> PRT
 <213> Neisseria meningitidis

<400> 1512

Met Glu Ile Arg Ala Ile Lys Tyr Thr Ala Met Ala Ala Leu Leu Ala
 1 5 10 15
 Phe Thr Val Ala Gly Cys Arg Leu Ala Gly Trp Tyr Glu Cys Ser Ser
 20 25 30
 Leu Ser Gly Trp Cys Lys Pro Arg Lys Pro Ala Ala Ile Asp Phe Trp
 35 40 45
 Asp Ile Gly Gly Glu Ser Pro Pro Ser Leu Glu Asp Tyr Glu Ile Pro
 50 55 60
 Leu Ser Asp Gly Asn Arg Ser Val Arg Ala Asn Glu Tyr Glu Ser Ala
 65 70 75 80
 Gln Gln Ser Tyr Phe Tyr Arg Lys Ile Gly Lys Phe Glu Ala Cys Gly
 85 90 95
 Leu Asp Trp Arg Thr Arg Asp Gly Lys Pro Leu Ile Glu Thr Phe Lys
 100 105 110
 Gln Glu Gly Phe Asp Cys Leu Lys Lys Gln Gly Leu Arg Arg Asn Gly
 115 120 125
 Leu Ser Glu Arg Val Arg Trp
 130 135

<210> 1513
 <211> 408
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1513
 atggaaattc gggtaataaa atatacggca acggtgcgt tgtttgcatt tacggttgca 60
 ggctgccggc tggcggggtg gtatgagtgt tcgtccttgc ccggtcgtg taagccgaga 120
 aaacctgccg ccatcgattt ttgggatatt ggcggcgaga gtccgctgtc tttagaggac 180
 tacgagatac cgctttcaga cggcaatcgt tccgtcaggg caaacgaata tgaatccgcg 240
 caaaaatctt acttttatag gaaaataggg aagtttgaag cctgcggggt ggattggcgt 300
 acgcgtgacg gcaaaccttt ggttgagagg ttcaaacagg aaggtttcga ctgtttgga 360
 aagcaggggt tgcggcgcaa cggcctgtcc gagcgcgtcc gatggtaa 408

<210> 1514
 <211> 135
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1514
 Met Glu Ile Arg Val Ile Lys Tyr Thr Ala Thr Ala Ala Leu Phe Ala
 1 5 10 15
 Phe Thr Val Ala Gly Cys Arg Leu Ala Gly Trp Tyr Glu Cys Ser Ser
 20 25 30
 Leu Ser Gly Trp Cys Lys Pro Arg Lys Pro Ala Ala Ile Asp Phe Trp
 35 40 45

Asp Ile Gly Gly Glu Ser Pro Leu Ser Leu Glu Asp Tyr Glu Ile Pro
 50 55 60
 Leu Ser Asp Gly Asn Arg Ser Val Arg Ala Asn Glu Tyr Glu Ser Ala
 65 70 75 80
 Gln Lys Ser Tyr Phe Tyr Arg Lys Ile Gly Lys Phe Glu Ala Cys Gly
 85 90 95
 Leu Asp Trp Arg Thr Arg Asp Gly Lys Pro Leu Val Glu Arg Phe Lys
 100 105 110
 Gln Glu Gly Phe Asp Cys Leu Glu Lys Gln Gly Leu Arg Arg Asn Gly
 115 120 125
 Leu Ser Glu Arg Val Arg Trp
 130 135

<210> 1515
 <211> 408
 <212> DNA
 <213> Neisseria meningitidis

<400> 1515
 atggaaaattc gggcaataaa atatacggca atggctgcgt tgcttgcatt tacggttgca 60
 ggctgccggc tggcggggtg gtatgagtgt tcgtccctca ccggctgggtg taagccgaga 120
 aaaccggctg ccatcgattt ttgggatatt ggcggcgaga gtccgccgtc tttaggggac 180
 tacgagatac cgctttcaga cggcaatcgt tccgtcaggg caaacgaata tgaatccgca 240
 caacaatctt acttttacag gaaaataggg aagtttgaag cctgcgggct ggattggcgt 300
 acgcgtgacg gcaaaccctt gattgagacg ttcaaacagg gaggatttga ctgcttggaa 360
 aagcaggggt tgcggcgcaa cggctctgtcc gagcgcgtcc gatggtaa 408

<210> 1516
 <211> 135
 <212> PRT
 <213> Neisseria meningitidis

<400> 1516
 Met Glu Ile Arg Ala Ile Lys Tyr Thr Ala Met Ala Ala Leu Leu Ala
 1 5 10 15
 Phe Thr Val Ala Gly Cys Arg Leu Ala Gly Trp Tyr Glu Cys Ser Ser
 20 25 30
 Leu Thr Gly Trp Cys Lys Pro Arg Lys Pro Ala Ala Ile Asp Phe Trp
 35 40 45
 Asp Ile Gly Gly Glu Ser Pro Pro Ser Leu Gly Asp Tyr Glu Ile Pro
 50 55 60
 Leu Ser Asp Gly Asn Arg Ser Val Arg Ala Asn Glu Tyr Glu Ser Ala
 65 70 75 80
 Gln Gln Ser Tyr Phe Tyr Arg Lys Ile Gly Lys Phe Glu Ala Cys Gly

85

90

95

Leu Asp Trp Arg Thr Arg Asp Gly Lys Pro Leu Ile Glu Thr Phe Lys
 100 105 110

Gln Gly Gly Phe Asp Cys Leu Glu Lys Gln Gly Leu Arg Arg Asn Gly
 115 120 125

Leu Ser Glu Arg Val Arg Trp
 130 135

<210> 1517

<211> 408

<212> DNA

<213> Neisseria meningitidis

<400> 1517

atggaaaattc gggcaataaa atatacggca atggctgcgt tgcttgcatt tacggttgca 60
 ggctgccggt tggcaggttg gtatgagtgt tcgtccctgt ccggctgggtg taagccgaga 120
 aaacctgccg ccatcgattt ttgggatatt ggcggcgaga gtcctccgtc tttagaggac 180
 tacgagatac cgctttcaga cggcaatcgt tccgtcaggg caaacgaata tgaatccgca 240
 caacaatctt acttttacag gaaaataggg aagtttgaag cctgcggggtt ggattggcgt 300
 acgcgtgacg gcaaaccctt gattgagacg ttcaaacagg aaggttttga ttgtttgaaa 360
 aagcaggggt tgcggcgcaa cggctctgtcc gagcgcgtcc gatggtaa 408

<210> 1518

<211> 135

<212> PRT

<213> Neisseria meningitidis

<400> 1518

Met Glu Ile Arg Ala Ile Lys Tyr Thr Ala Met Ala Ala Leu Leu Ala
 1 5 10 15

Phe Thr Val Ala Gly Cys Arg Leu Ala Gly Trp Tyr Glu Cys Ser Ser
 20 25 30

Leu Ser Gly Trp Cys Lys Pro Arg Lys Pro Ala Ala Ile Asp Phe Trp
 35 40 45

Asp Ile Gly Gly Glu Ser Pro Pro Ser Leu Glu Asp Tyr Glu Ile Pro
 50 55 60

Leu Ser Asp Gly Asn Arg Ser Val Arg Ala Asn Glu Tyr Glu Ser Ala
 65 70 75 80

Gln Gln Ser Tyr Phe Tyr Arg Lys Ile Gly Lys Phe Glu Ala Cys Gly
 85 90 95

Leu Asp Trp Arg Thr Arg Asp Gly Lys Pro Leu Ile Glu Thr Phe Lys
 100 105 110

Gln Glu Gly Phe Asp Cys Leu Lys Lys Gln Gly Leu Arg Arg Asn Gly
 115 120 125

Leu Ser Glu Arg Val Arg Trp
130 135

<210> 1519
<211> 359
<212> DNA
<213> *Neisseria gonorrhoeae*

<400> 1519
atgaccata tcaaaccggt cattgccgcg ctgcactca tcgggcttgc cgctgctcc 60
ggcagcaaaa ccgaacagcc caagctcgac taccaaagcc ggtcgcaccg cctgatcaaa 120
ctcgaagtcc cgcctgattt gaacaacccc gaccaaggca acctctaccg cctgcctgcc 180
ggttcgggag ccgtccgcgc cggggatttg gaaaaacgcc gcacaccgc cgtccaacag 240
ccagcggatg ccggaagtat tgaaaagcgt caaaggcgtc cgcttcgagc ggcgacggca 300
gccaacgcct ggcttgctgt tgacggcaaa tccccgcgcg aaatctccgc cgctttctg 359

<210> 1520
<211> 119
<212> PRT
<213> *Neisseria gonorrhoeae*

<400> 1520
Met Thr His Ile Lys Pro Val Ile Ala Ala Leu Ala Leu Ile Gly Leu
1 5 10 15
Ala Ala Cys Ser Gly Ser Lys Thr Glu Gln Pro Lys Leu Asp Tyr Gln
20 25 30
Ser Arg Ser His Arg Leu Ile Lys Leu Glu Val Pro Pro Asp Leu Asn
35 40 45
Asn Pro Asp Gln Gly Asn Leu Tyr Arg Leu Pro Ala Gly Ser Gly Ala
50 55 60
Val Arg Ala Gly Asp Leu Glu Lys Arg Arg Thr Pro Ala Val Gln Gln
65 70 75 80
Pro Ala Asp Ala Gly Ser Ile Glu Lys Arg Gln Arg Arg Pro Leu Arg
85 90 95
Ala Ala Thr Ala Ala Asn Ala Trp Leu Val Val Asp Gly Lys Ser Pro
100 105 110
Ala Glu Ile Ser Ala Ala Phe
115

<210> 1521
<211> 1128
<212> DNA
<213> *Neisseria meningitidis*

<400> 1521
atgaccata tcaaaccggt cattgccgcg ctgcactca tcgggcttgc cgctgctcc 60
ggcagcaaaa ccgaacagcc caagctcgac taccaaagcc ggtcgcaccg cctgatcaaa 120

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cttgaagtcc cacctgattt gaacaacccc gaccaaggca acctctaccg cctgcctgcc 180
ggttcgggcg ccgtccgcgc cagcgatttg gaaaaacgcc gcacaccgcg cgtccaacag 240
cctgccgatg ccgaagtatt gaaaagcgtc aaaggtgtcc gcctcgagcg cgacggcagc 300
caacgctggc tegtgtcga cggcaagtct cctgccgaaa tctggccgct cctgaaagcc 360
ttttggcagg aaaacggctt cgacatcaaa tccgaagaac ccgccatcgg acaaattgaa 420
accgagtggg cggaaaaccg cgccaaaatc cccaagaca gcttgcgccg cctcttcgac 480
aaagtcggct tgggcggcat ctactccacc ggcgagcgcg acaaattcat cgtccgtatc 540
gaacagggca aaaacggcgt ttccgacatc ttcttcgccc acaaagccat gaaagaagtg 600

tacggcggca aagacaaaga cacgaccgta tggcagccct ccccgtcoga tcccaacctc 660
gaagccgctt tcctgacgcg ctttatgcaa tatttgggcg ttgacggaca gcaggcgga 720
aacgcatcgg caaaaaaacc tacccttccc gccgccaacg aaatggcgcg tatcgaaggc 780
aaaagcctga ttgtcttttg cgactacggc agaaactggc ggcgcaccgt gctcgccctc 840
gaccgcatcg ggctgaccgt cgtcgggtcaa aacaccgaac gccacgcctt cctggttcaa 900
aaagccccga acgaaagcaa tgcagttacc gaacaaaaac ccggcctggt caaacgcctg 960
ctgggcaaag gcaaaagcga gaaacctgcc gaacagccgg aactgattgt ctatgcagaa 1020
cctgtcgcca acggctcgcg catcgctcctg ctcaacaaag acggcagcgc atatgccggc 1080
aaagacgcat ccgcattatt gggcaaaactc cattccgaac tgcgttaa 1128

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<210> 1522

<211> 375

<212> PRT

<213> Neisseria meningitidis

<400> 1522

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Met Thr His Ile Lys Pro Val Ile Ala Ala Leu Ala Leu Ile Gly Leu
  1             5             10            15

Ala Ala Cys Ser Gly Ser Lys Thr Glu Gln Pro Lys Leu Asp Tyr Gln
 20             25            30

Ser Arg Ser His Arg Leu Ile Lys Leu Glu Val Pro Pro Asp Leu Asn
 35             40            45

Asn Pro Asp Gln Gly Asn Leu Tyr Arg Leu Pro Ala Gly Ser Gly Ala
 50             55            60

Val Arg Ala Ser Asp Leu Glu Lys Arg Arg Thr Pro Ala Val Gln Gln
 65             70            75            80

Pro Ala Asp Ala Glu Val Leu Lys Ser Val Lys Gly Val Arg Leu Glu
 85             90            95

Arg Asp Gly Ser Gln Arg Trp Leu Val Val Asp Gly Lys Ser Pro Ala
100            105            110

Glu Ile Trp Pro Leu Leu Lys Ala Phe Trp Gln Glu Asn Gly Phe Asp
115            120            125

Ile Lys Ser Glu Glu Pro Ala Ile Gly Gln Met Glu Thr Glu Trp Ala
130            135            140

Glu Asn Arg Ala Lys Ile Pro Gln Asp Ser Leu Arg Arg Leu Phe Asp
145            150            155            160

Lys Val Gly Leu Gly Gly Ile Tyr Ser Thr Gly Glu Arg Asp Lys Phe

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| | | | | | |
|-------------|---|-----|-----|-----|-----|
| | 165 | | 170 | | 175 |
| Ile Val Arg | Ile Glu Gln Gly Lys Asn Gly Val Ser Asp Ile Phe Phe | | | | |
| | 180 | | 185 | | 190 |
| Ala His Lys | Ala Met Lys Glu Val Tyr Gly Gly Lys Asp Lys Asp Thr | | | | |
| | 195 | | 200 | | 205 |
| Thr Val Trp | Gln Pro Ser Pro Ser Asp Pro Asn Leu Glu Ala Ala Phe | | | | |
| | 210 | | 215 | | 220 |
| Leu Thr Arg | Phe Met Gln Tyr Leu Gly Val Asp Gly Gln Gln Ala Glu | | | | |
| | 225 | | 230 | | 235 |
| Asn Ala Ser | Ala Lys Lys Pro Thr Leu Pro Ala Ala Asn Glu Met Ala | | | | |
| | | 245 | | 250 | 255 |
| Arg Ile Glu | Gly Lys Ser Leu Ile Val Phe Gly Asp Tyr Gly Arg Asn | | | | |
| | 260 | | 265 | | 270 |
| Trp Arg Arg | Thr Val Leu Ala Leu Asp Arg Ile Gly Leu Thr Val Val | | | | |
| | 275 | | 280 | | 285 |
| Gly Gln Asn | Thr Glu Arg His Ala Phe Leu Val Gln Lys Ala Pro Asn | | | | |
| | 290 | | 295 | | 300 |
| Glu Ser Asn | Ala Val Thr Glu Gln Lys Pro Gly Leu Phe Lys Arg Leu | | | | |
| | 305 | | 310 | | 315 |
| Leu Gly Lys | Gly Lys Ala Glu Lys Pro Ala Glu Gln Pro Glu Leu Ile | | | | |
| | | 325 | | 330 | 335 |
| Val Tyr Ala | Glu Pro Val Ala Asn Gly Ser Arg Ile Val Leu Leu Asn | | | | |
| | 340 | | 345 | | 350 |
| Lys Asp Gly | Ser Ala Tyr Ala Gly Lys Asp Ala Ser Ala Leu Leu Gly | | | | |
| | 355 | | 360 | | 365 |
| Lys Leu His | Ser Glu Leu Arg | | | | |
| | 370 | | 375 | | |

<210> 1523

<211> 1128

<212> DNA

<213> Neisseria meningitidis

<400> 1523

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atgacccata tcaaaccggt cattgccgcg ctgcactca tcgggcttgc cgctgtctcc 60
ggcagcaaaa ccgaacagcc caagctcgac taccaaagcc ggtcgcaccg cctgatcaaa 120
ctogaagtcc cacctgattt gaacaacccc gaccaaggca acctctaccg cctgcctgcc 180
ggttcgggcg ccgtccgcgc cagcgatttg gaaaaacgcc gcacaccgcg cgtccaacag 240
cctgccgatg ccgaagtatt gaaaagcgtc aaaggtgtcc gcctcgagcg cgacggcagc 300
caacgctggc tcgttgtcga cggcaagtct catgccgaaa tctggccgct cctgaaagcc 360
ttttggcagg aaaacggctt cgacatcaaa tccgaagaac ccgccatcgg acaaatggaa 420
accgagtggg cggaaaaccg tgccaaaatc cccaagaca gcttgcgcgg cctattcgac 480
acagtcgggt tgggcggcat ctactccacc ggcgagcgcg acaaattcat cgtccgtatc 540

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gaacagggca aaaacggcgt ttccgacatc ttcttcgccc acaaagccat gaaagaagtg 600
tacggcggca aagacaaaga cacgaccgta tggcagccct ccccgtcgga tcccaacctc 660
gaagccgctt tcctgacgcg ctttatgcaa tatttgggcg ttgacggaca gcaggcggaa 720
aacgcacgcg caaaaaaacc tacccttccc gccgccaacg aaatggcgcg tatcgaaggc 780
aaaagcctga ttgtottttg cgactacggc agaaactggc ggcgccaccgc gctcgccctc 840
gaccgcacg cgctgaccgt cgtcgggtcaa aacaccgaac gccacgcttt cctggttcaa 900
aaagccccga acgaaagcaa tgcagttacc gaacaaaaac ccggcctggt caaacgcctg 960
ctgggcaaag gcaaagcgga gaaacctgcc gaacagccgg aactgattgt ctatgccgag 1020
cctgtcgcca acggctcgcg catcgtcctg ctcaacaaag acggcagcgc atatgccggc 1080
aaagacgcat ccgcattatt gggcaaacct cattccgaac tgcgttaa 1128

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<210> 1524

<211> 375

<212> PRT

<213> Neisseria meningitidis

<400> 1524

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Met Thr His Ile Lys Pro Val Ile Ala Ala Leu Ala Leu Ile Gly Leu
  1             5             10             15

Ala Ala Cys Ser Gly Ser Lys Thr Glu Gln Pro Lys Leu Asp Tyr Gln
      20             25             30

Ser Arg Ser His Arg Leu Ile Lys Leu Glu Val Pro Pro Asp Leu Asn
      35             40             45

Asn Pro Asp Gln Gly Asn Leu Tyr Arg Leu Pro Ala Gly Ser Gly Ala
      50             55             60

Val Arg Ala Ser Asp Leu Glu Lys Arg Arg Thr Pro Ala Val Gln Gln
      65             70             75             80

Pro Ala Asp Ala Glu Val Leu Lys Ser Val Lys Gly Val Arg Leu Glu
      85             90             95

Arg Asp Gly Ser Gln Arg Trp Leu Val Val Asp Gly Lys Ser His Ala
      100            105            110

Glu Ile Trp Pro Leu Leu Lys Ala Phe Trp Gln Glu Asn Gly Phe Asp
      115            120            125

Ile Lys Ser Glu Glu Pro Ala Ile Gly Gln Met Glu Thr Glu Trp Ala
      130            135            140

Glu Asn Arg Ala Lys Ile Pro Gln Asp Ser Leu Arg Arg Leu Phe Asp
      145            150            155            160

Thr Val Gly Leu Gly Gly Ile Tyr Ser Thr Gly Glu Arg Asp Lys Phe
      165            170            175

Ile Val Arg Ile Glu Gln Gly Lys Asn Gly Val Ser Asp Ile Phe Phe
      180            185            190

Ala His Lys Ala Met Lys Glu Val Tyr Gly Gly Lys Asp Lys Asp Thr
      195            200            205

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Thr Val Trp Gln Pro Ser Pro Ser Asp Pro Asn Leu Glu Ala Ala Phe
 210 215 220

Leu Thr Arg Phe Met Gln Tyr Leu Gly Val Asp Gly Gln Gln Ala Glu
 225 230 235 240

Asn Ala Ser Ala Lys Lys Pro Thr Leu Pro Ala Ala Asn Glu Met Ala
 245 250 255

Arg Ile Glu Gly Lys Ser Leu Ile Val Phe Gly Asp Tyr Gly Arg Asn
 260 265 270

Trp Arg Arg Thr Ala Leu Ala Leu Asp Arg Ile Gly Leu Thr Val Val
 275 280 285

Gly Gln Asn Thr Glu Arg His Ala Phe Leu Val Gln Lys Ala Pro Asn
 290 295 300

Glu Ser Asn Ala Val Thr Glu Gln Lys Pro Gly Leu Phe Lys Arg Leu
 305 310 315 320

Leu Gly Lys Gly Lys Ala Glu Lys Pro Ala Glu Gln Pro Glu Leu Ile
 325 330 335

Val Tyr Ala Glu Pro Val Ala Asn Gly Ser Arg Ile Val Leu Leu Asn
 340 345 350

Lys Asp Gly Ser Ala Tyr Ala Gly Lys Asp Ala Ser Ala Leu Leu Gly
 355 360 365

Lys Leu His Ser Glu Leu Arg
 370 375

<210> 1525
 <211> 300
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1525
 atgagtgcga gcgcggcaat gacgggtttg atatgggtca tcgtgtcatc ctgtgtgatg 60
 gatattaaag tgtttgatcat gttatgccgt ccgaacggtt cagacggcat ggctatatatt 120
 aaagttgtcc tgaggctttc agggcggcgc ggacttttgc ctgtccgcct tccgtcagcg 180
 gaacgagcgg caggcgcacg tgcggtccgc atccgcccac gccgataacc gccatttcg 240
 gtgcggcggg actgggttcg cagaacatgg tgtcgtaaata cggaatcagc cggtcgttga 300

<210> 1526
 <211> 99
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1526
 Met Ser Ala Ser Ala Ala Met Thr Gly Leu Ile Trp Val Ile Val Ser
 1 5 10 15

Ser Cys Val Met Asp Ile Lys Val Phe Val Met Leu Cys Arg Pro Asn

20 25 30
 Gly Ser Asp Gly Met Ala Ile Phe Lys Val Val Leu Arg Leu Ser Gly
 35 40 45
 Arg Arg Gly Leu Leu Pro Val Arg Leu Pro Ser Ala Glu Arg Ala Ala
 50 55 60
 Gly Ala Arg Ala Val Arg Ile Arg Pro Arg Arg Ile Pro Pro Ile Ser
 65 70 75 80
 Val Arg Arg Asp Trp Val Arg Arg Thr Trp Cys Arg Lys Ser Glu Ser
 85 90 95
 Ala Gly Arg

<210> 1527
 <211> 300
 <212> DNA
 <213> Neisseria meningitidis

<400> 1527
 wtgagtgcga ggcgggcaat gacgggtytg atatgggtca tcgtgtcatc stgtgtgatg 60
 gatattaaag tgtytggtgc gwtatgccgt ccgaacgggt cggacggcat ggmtatattt 120
 aaagttgtcc tgaggctttc agggcggcgc ggactkttgc wtgtccgttt yccgtcagcg 180
 gaacgagcgg caggcggacg tgcggttcgc atctgcccag ggcgataacc gccatttcg 240
 gtgcggcggg gctgggttcg cagaacatgg tgcgttaaatt cggaatcagt cggtcgttga 300

<210> 1528
 <211> 99
 <212> PRT
 <213> Neisseria meningitidis

<400> 1528
 Xaa Ser Ala Ser Ala Ala Met Thr Gly Leu Ile Trp Val Ile Val Ser
 1 5 10 15
 Ser Cys Val Met Asp Ile Lys Val Xaa Val Ala Xaa Cys Arg Pro Asn
 20 25 30
 Gly Ser Asp Gly Met Xaa Ile Phe Lys Val Val Leu Arg Leu Ser Gly
 35 40 45
 Arg Arg Gly Leu Leu Xaa Val Arg Phe Pro Ser Ala Glu Arg Ala Ala
 50 55 60
 Gly Gly Arg Ala Val Arg Ile Cys Pro Gly Arg Ile Pro Pro Ile Ser
 65 70 75 80
 Val Arg Arg Gly Trp Val Arg Arg Thr Trp Cys Arg Lys Ser Glu Ser
 85 90 95
 Val Gly Arg

<210> 1529
<211> 300
<212> DNA
<213> *Neisseria meningitidis*

<400> 1529
atgagtgcga ggcgggcaat gacgggtttg atatgggtca tcgtgtcatc ctgtgtgatg 60
gatattaaag tgtttggtgc gttatgccgt ccgaacggtt cggacggcat ggctatatatt 120
aaagttgtcc tgaggctttc agggcggcgc ggacttttgc ctgtccgcct tccgtcagcg 180
gaacgagcgg caggcggacg tgcggttcgc atctgcccag ggcgataacc gccatttcg 240
gtgcggcggg gctgggttcg cagaacatgg tgcgtaaat cggaatcagc cggtcgttga 300

<210> 1530
<211> 99
<212> PRT
<213> *Neisseria meningitidis*

<400> 1530
Met Ser Ala Ser Ala Ala Met Thr Gly Leu Ile Trp Val Ile Val Ser
1 5 10 15
Ser Cys Val Met Asp Ile Lys Val Phe Val Ala Leu Cys Arg Pro Asn
20 25 30
Gly Ser Asp Gly Met Ala Ile Phe Lys Val Val Leu Arg Leu Ser Gly
35 40 45
Arg Arg Gly Leu Leu Pro Val Arg Leu Pro Ser Ala Glu Arg Ala Ala
50 55 60
Gly Gly Arg Ala Val Arg Ile Cys Pro Gly Arg Ile Pro Pro Ile Ser
65 70 75 80
Val Arg Arg Gly Trp Val Arg Arg Thr Trp Cys Arg Lys Ser Glu Ser
85 90 95
Ala Gly Arg

<210> 1531
<211> 489
<212> DNA
<213> *Neisseria gonorrhoeae*

<400> 1531
atgaccgccc tactcgtcat cctcgccctc gccctgatag ccgtcggcac ggcaggcatc 60
gtctatcccg ccctgcccgg cttggcattg atgtttgccg gaacatggct gcttgccctat 120
gccggcgggt atcaaactca cggcgcaggc atcttgtgga cggtcggact catcagcctt 180
ggcggcatac tggcggacta tatggcaggc atgttggggg taaaatacac tggggcaggc 240
aaactcgccg tccgaggtgc attggccggc agcatcatcg gcataatttt ctcccttccc 300
ggactaatac tcggcccctt tatcggcgcg gcggcaggcg aactgatcga tcggcgcaat 360
atgcttcagg caggtaaagc gggcttgggt acgctgttgg ggcttgtcgt cggcacggcg 420
ttcaaaatcg gctgcgccgt atccatcttg tttatcctgt tggtgaaata catcgcatatc 480

ctgttttaa

489

<210> 1532

<211> 162

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1532

Met Thr Ala Leu Leu Val Ile Leu Ala Leu Ala Leu Ile Ala Val Gly
1 5 10 15

Thr Ala Gly Ile Val Tyr Pro Ala Leu Pro Gly Leu Ala Leu Met Phe
20 25 30

Ala Gly Thr Trp Leu Leu Ala Tyr Ala Gly Gly Tyr Gln Ile Tyr Gly
35 40 45

Ala Gly Ile Leu Trp Thr Val Gly Leu Ile Ser Leu Gly Gly Ile Leu
50 55 60

Ala Asp Tyr Met Ala Gly Met Leu Gly Val Lys Tyr Thr Gly Ala Gly
65 70 75 80

Lys Leu Ala Val Arg Gly Ala Leu Ala Gly Ser Ile Ile Gly Ile Phe
85 90 95

Phe Ser Leu Pro Gly Leu Ile Leu Gly Pro Phe Ile Gly Ala Ala Ala
100 105 110

Gly Glu Leu Ile Asp Arg Arg Asn Met Leu Gln Ala Gly Lys Ala Gly
115 120 125

Leu Gly Thr Leu Leu Gly Leu Val Val Gly Thr Ala Phe Lys Ile Gly
130 135 140

Cys Ala Val Ser Ile Leu Phe Ile Leu Leu Val Lys Tyr Ile Ala Tyr
145 150 155 160

Leu Phe

<210> 1533

<211> 489

<212> DNA

<213> *Neisseria meningitidis*

<400> 1533

atgaccgtac tgaccgtcat cctcgccctc gccctgatag ccgtcggcac ggcgggcattc 60
gtttaccccg ccctgcccgg attggcattg atgtttgccg gaacatggct gcttgccctat 120
gccggcgggt accaaatcta cggcgcgggc gttttgtgga cggtcggact catcagcctt 180
gccggcatac tggcggacta tgtggcaggc atatggggga caaaatatac cggagcgggc 240
aagctcgccg ttcgcggcgc attggccggc agcatcatcg gcatattttt ctcccttccc 300
ggactaatac tcggtccctt tatcggcgcg gcggcaggcg aactgatcga acggcgcaat 360
atgcttcagg caggtaaagc gggcttgggt acgctgttgg ggcttgtcgt cggcacggcg 420

ttcaaaatcg gctgcgcngt atccatcttg tttatcctgt tggtgaaata catcgcctac 480
ctgttttaa 489

<210> 1534
<211> 162
<212> PRT
<213> Neisseria meningitidis

<400> 1534
Met Thr Val Leu Thr Val Ile Leu Ala Leu Ala Leu Ile Ala Val Gly
1 5 10 15
Thr Ala Gly Ile Val Tyr Pro Ala Leu Pro Gly Leu Ala Leu Met Phe
20 25 30
Ala Gly Thr Trp Leu Leu Ala Tyr Ala Gly Gly Tyr Gln Ile Tyr Gly
35 40 45
Ala Gly Val Leu Trp Thr Val Gly Leu Ile Ser Leu Ala Gly Ile Leu
50 55 60
Ala Asp Tyr Val Ala Gly Ile Trp Gly Thr Lys Tyr Thr Gly Ala Gly
65 70 75 80
Lys Leu Ala Val Arg Gly Ala Leu Ala Gly Ser Ile Ile Gly Ile Phe
85 90 95
Phe Ser Leu Pro Gly Leu Ile Leu Gly Pro Phe Ile Gly Ala Ala Ala
100 105 110
Gly Glu Leu Ile Glu Arg Arg Asn Met Leu Gln Ala Gly Lys Ala Gly
115 120 125
Leu Gly Thr Leu Leu Gly Leu Val Val Gly Thr Ala Phe Lys Ile Gly
130 135 140
Cys Ala Val Ser Ile Leu Phe Ile Leu Leu Val Lys Tyr Ile Ala Tyr
145 150 155 160
Leu Phe

<210> 1535
<211> 489
<212> DNA
<213> Neisseria meningitidis

<400> 1535
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tccggcgggt accaaatcta cggcgcgggc gttttgtgga cggtcggact catcagcctt 180
gccggcatac tggcggacta tgtggcaggc atatggggga caaaatatac cggagcgggc 240
aagctcgccg ttgcgggcgc attggccggc agcatcatcg gcatatTTTT ctcccttccc 300
ggactaatac tcggtcctt tatcggcgcg gcggcaggcg aactgatcga acggcgcaat 360

atgcttcagg caggtaaagc gggcttgggt acgctgttgg ggcttatcgt cggtacggcg 420
 ttcaaaatcg gctgcgccgt atccatcttg tttatcctgt tggtgaaata catcgccctac 480
 ctgttttaa 489

<210> 1536
 <211> 162
 <212> PRT
 <213> Neisseria meningitidis

<400> 1536
 Met Thr Ala Leu Leu Val Ile Leu Ala Leu Ala Leu Ile Ala Ala Gly
 1 5 10 15
 Thr Ala Gly Ile Val Tyr Pro Ala Leu Pro Gly Leu Ala Leu Met Phe
 20 25 30
 Ala Gly Thr Trp Leu Leu Ala Tyr Ser Gly Gly Tyr Gln Ile Tyr Gly
 35 40 45
 Ala Gly Val Leu Trp Thr Val Gly Leu Ile Ser Leu Ala Gly Ile Leu
 50 55 60
 Ala Asp Tyr Val Ala Gly Ile Trp Gly Thr Lys Tyr Thr Gly Ala Gly
 65 70 75 80
 Lys Leu Ala Val Arg Gly Ala Leu Ala Gly Ser Ile Ile Gly Ile Phe
 85 90 95
 Phe Ser Leu Pro Gly Leu Ile Leu Gly Pro Phe Ile Gly Ala Ala Ala
 100 105 110
 Gly Glu Leu Ile Glu Arg Arg Asn Met Leu Gln Ala Gly Lys Ala Gly
 115 120 125
 Leu Gly Thr Leu Leu Gly Leu Ile Val Gly Thr Ala Phe Lys Ile Gly
 130 135 140
 Cys Ala Val Ser Ile Leu Phe Ile Leu Leu Val Lys Tyr Ile Ala Tyr
 145 150 155 160
 Leu Phe

<210> 1537
 <211> 330
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1537
 atggctgaaa caatgaaaaa acaggcggat tcgcctgatt tgggtgtacgg tttggaagac 60
 aggccgcgct tcggtaatgc gctcttgagc gcggttaccc atcttttggc gattttcgtg 120
 ccgatgatta cgcccgcgct gattgtgggc ggcgcgctgg aattgccggt ggagatgacg 180
 gcgtatctgg tgtcgatggc gatggttgcg tcgggtgtcg gcacttattt gcaggtaaac 240
 cgcttcgggt cggtcggctc ggggatgctg tccatccagc gttaccgtca tgattgcgct 300

cggcgcgggg atgaaagagg gcggtttgag

330

<210> 1538

<211> 110

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1538

Met Ala Glu Thr Met Lys Lys Gln Ala Asp Ser Pro Asp Leu Val Tyr
1 5 10 15

Gly Leu Glu Asp Arg Pro Pro Phe Gly Asn Ala Leu Leu Ser Ala Val
20 25 30

Thr His Leu Leu Ala Ile Phe Val Pro Met Ile Thr Pro Ala Leu Ile
35 40 45

Val Gly Gly Ala Leu Glu Leu Pro Val Glu Met Thr Ala Tyr Leu Val
50 55 60

Ser Met Ala Met Val Ala Ser Gly Val Gly Thr Tyr Leu Gln Val Asn
65 70 75 80

Arg Phe Gly Ser Val Gly Ser Gly Met Leu Ser Ile Gln Arg Tyr Arg
85 90 95

His Asp Cys Ala Arg Arg Gly Asp Glu Arg Gly Arg Phe Glu
100 105 110

<210> 1539

<211> 1392

<212> DNA

<213> Neisseria meningitidis

<400> 1539

atgagcggtc agttgggcaa aggtgcggat ggccttgatt tgggtgtacgg tttggaagac 60
aggccgcgct tcggtaaatgc gctcttgagc gcggttaccc atcttttggc gatttttgtg 120
ccgatgatta cgcccgcgct gattgtgggc ggcgcgctgg aattgcgggt ggagatgacg 180
gcgtatctcg tgtcgatggc gatggttgcg tcgggtgctg gcacttattt gcaggccaac 240
cgcttcgggc cggtcgggtt cgggatgctg tccatccagt cggagaattt ttcgttcgtt 300
accgtgatga ttgcgctggg cgcggggatg aaagagggcg gtttgactaa ggatgcgatg 360
atttcgacgc tcttgggcgt atcgtttgct ggcgcgtttt tgggtgtgtt ctcggcggtg 420
cttctgccgt atttgaaaaa agtgattacg ccgacgggtc gcggcggtgt cgtgatgctc 480
attgggttga gtttggtaca cgtcggcatt accgatttcg gcggcggtt cggcggaag 540
gcggacggca cgttcggtc gatggaaaac ttggggctgg catcgctggt gttgctgatt 600
gtggttggtg tcaactgcat gaaaaacccg ctgttcgca tgagcggcat tgcggtcggg 660
ctgattgccg gctatatcgt cgcgctgttt ttgggcaagg tggatttttc cgcgctgcaa 720
aacctgccgc tggttacgct gcccgctaccg tttaaatacg gttttgcttt cgactggcac 780
gcgtttattg tggcggggcg gattttcttg ttgagcgtgt ttgaggcggg cggcgattta 840
accgcgacgg caatggtgtc cgaccagccg attgaaggcg aggaatacac caaacgcctg 900
cgcggcggcg tggttggtga cggcttggtg tcggtgattg cgacggcttt gggttcgtg 960
ccgctgacga cgtttgcgca aaacaacggc gtgattcaga tgaccggcgt ggcttcgcgc 1020
catgtgggca aatatattgc cgtgattttg gtgctgttg gtctgttccc cgttgctcgt 1080
cgcgcgttta cgacgattcc gactccggtg ttgggcggcg cgatggtttt gatgttcggc 1140
ttaattgca ttgcgggcgt gcggattttg gtcagtcacg gcatccgcag gcgcgaagcg 1200

gtgattgcgg caacgtcggg cggtttgggc ttgggtgtcg cgtttgagcc ggaagtgttt 1260
 aaaaacctgc ccgtcttggt ccaaaactct atttcgccc gcggcattac ggcagtcttg 1320
 ctgaatttgg tcttgcccga agataaaaacc gaggcggcgg tcaagtttga taccgaccac 1380
 ttggaacact ga 1392

<210> 1540

<211> 463

<212> PRT

<213> Neisseria meningitidis

<400> 1540

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Gly | Gln | Leu | Gly | Lys | Gly | Ala | Asp | Ala | Pro | Asp | Leu | Val | Tyr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Leu | Glu | Asp | Arg | Pro | Pro | Phe | Gly | Asn | Ala | Leu | Leu | Ser | Ala | Val |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Thr | His | Leu | Leu | Ala | Ile | Phe | Val | Pro | Met | Ile | Thr | Pro | Ala | Leu | Ile |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Val | Gly | Gly | Ala | Leu | Glu | Leu | Pro | Val | Glu | Met | Thr | Ala | Tyr | Leu | Val |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Ser | Met | Ala | Met | Val | Ala | Ser | Gly | Val | Gly | Thr | Tyr | Leu | Gln | Val | Asn |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Arg | Phe | Gly | Pro | Val | Gly | Ser | Gly | Met | Leu | Ser | Ile | Gln | Ser | Val | Asn |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Phe | Ser | Phe | Val | Thr | Val | Met | Ile | Ala | Leu | Gly | Ala | Gly | Met | Lys | Glu |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Gly | Gly | Leu | Thr | Lys | Asp | Ala | Met | Ile | Ser | Thr | Leu | Leu | Gly | Val | Ser |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Phe | Val | Gly | Ala | Phe | Leu | Val | Cys | Phe | Ser | Ala | Trp | Leu | Leu | Pro | Tyr |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Leu | Lys | Lys | Val | Ile | Thr | Pro | Thr | Val | Ser | Gly | Val | Val | Val | Met | Leu |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Ile | Gly | Leu | Ser | Leu | Val | His | Val | Gly | Ile | Thr | Asp | Phe | Gly | Gly | Gly |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Phe | Gly | Ala | Lys | Ala | Asp | Gly | Thr | Phe | Gly | Ser | Met | Glu | Asn | Leu | Gly |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Leu | Ala | Ser | Leu | Val | Leu | Leu | Ile | Val | Leu | Val | Phe | Asn | Cys | Met | Lys |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Asn | Pro | Leu | Leu | Arg | Met | Ser | Gly | Ile | Ala | Val | Gly | Leu | Ile | Ala | Gly |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Tyr | Ile | Val | Ala | Leu | Phe | Leu | Gly | Lys | Val | Asp | Phe | Ser | Ala | Leu | Gln |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |

Asn Leu Pro Leu Val Thr Leu Pro Val Pro Phe Lys Tyr Gly Phe Ala
 245 250 255
 Phe Asp Trp His Ala Phe Ile Val Ala Gly Ala Ile Phe Leu Leu Ser
 260 265 270
 Val Phe Glu Ala Val Gly Asp Leu Thr Ala Thr Ala Met Val Ser Asp
 275 280 285
 Gln Pro Ile Glu Gly Glu Glu Tyr Thr Lys Arg Leu Arg Gly Gly Val
 290 295 300
 Leu Ala Asp Gly Leu Val Ser Val Ile Ala Thr Ala Leu Gly Ser Leu
 305 310 315 320
 Pro Leu Thr Thr Phe Ala Gln Asn Asn Gly Val Ile Gln Met Thr Gly
 325 330 335
 Val Ala Ser Arg His Val Gly Lys Tyr Ile Ala Val Ile Leu Val Leu
 340 345 350
 Leu Gly Leu Phe Pro Val Val Gly Arg Ala Phe Thr Thr Ile Pro Ser
 355 360 365
 Pro Val Leu Gly Gly Ala Met Val Leu Met Phe Gly Leu Ile Ala Ile
 370 375 380
 Ala Gly Val Arg Ile Leu Val Ser His Gly Ile Arg Arg Arg Glu Ala
 385 390 395 400
 Val Ile Ala Ala Thr Ser Val Gly Leu Gly Leu Gly Val Ala Phe Glu
 405 410 415
 Pro Glu Val Phe Lys Asn Leu Pro Val Leu Phe Gln Asn Ser Ile Ser
 420 425 430
 Ala Gly Gly Ile Thr Ala Val Leu Leu Asn Leu Val Leu Pro Glu Asp
 435 440 445
 Lys Thr Glu Ala Ala Val Lys Phe Asp Thr Asp His Leu Glu His
 450 455 460

<210> 1541

<211> 1392

<212> DNA

<213> Neisseria meningitidis

<400> 1541

atgagcggtc agttgggcaa aggtgcggat ggcgctgatt tgggtgtacgg tttggaggat 60
 aggccgccgt tcggtaatgc gctcttgagc gcggttaccc atcttttggc gatttttgtg 120
 ccgatgatta cgcccgcgct gattgtgggc ggcgcgctgg aattgccggt ggagatgacg 180
 gcgtatctcg tgtcgatggc gatggttgcg tcgggtgtcg gcacttattt gcagggtcaac 240
 cgcttcgggc cggtcggttc ggggatgctg tccatccagt cggtgaattt ctcgttcggt 300
 accgtcatga ttgcgctcgg cgcggggatg aaagagggcg gtttgactaa ggatgcgatg 360
 atttcgacgc tcttgggcgt atcgtttgcg ggcgcgtttt tgggtgtgtt ttcggcggtg 420
 cttctgccgt atttgaaaaa agtgattacg ccgacggtca gcggtgtggt ggtgatgctg 480

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atcggccttga gtttggtaga cgtcgggtatt accgatttcg gcggcgggctt cggcgcaaag 540
gcggacggca cgttcggctc gatggaaaac ttggggctgg catcgctggg gctgctgatt 600
gtgctgggtgt tcaattgcat gaaaaacccg ctgctgcgga tgagcggcat tgcggtcggg 660
ctgattgccg gctatatcgt cgcgctgttt ttgggcaagg tggatttttc ggcactgcaa 720
aacctgccgc tggttacgct gcccgtagcg tttaaatatg gttttgcttt tgactggcac 780
gcattttattg tggcgggtgc gattttcttg ttgagcgtgt ttgaggcggt cggcgatttg 840
acggcgacgg caatggtgtc cgaccagccg attgaaggcg aggaatacac caaacgcttg 900
cgcgggcggcg tgttggcgga cggcttggtg tgggtgattg cgacggcttt gggttcgcgtg 960
ccgctgacga cgtttgcaca aaacaacggc gtgattcaga tgaccggcgt ggcttcgcgc 1020
catgtgggca aatatattgc cgtgattttg gtgctgttg gtctgttccc cgttgctcga 1080
cgcgcggtta cgacgattcc gagtcgggtg ttgggcggcg cgatggtttt gatgttcggc 1140
ttgattgcga ttgcgggctg gcggattttg gtcagccacg gcatccgcag gcgcgaagcg 1200
gtaattgcgg caacgtcggg cggtttgggc ttgggtgtcg cgtttgagcc ggaagtgttt 1260
aaaaacctgc ccgtcttggt ccaaaactct atttcgcgcg gcggcattac ggcagtcttg 1320
ctgaatttgg tcttgcccga agataaaacc gaggcggcgg tcaagtttga taccgaccac 1380
ttggaacact ga                                     1392

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<210> 1542
 <211> 463
 <212> PRT
 <213> *Neisseria meningitidis*

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<400> 1542
Met Ser Gly Gln Leu Gly Lys Gly Ala Asp Ala Pro Asp Leu Val Tyr
 1             5             10             15

Gly Leu Glu Asp Arg Pro Pro Phe Gly Asn Ala Leu Leu Ser Ala Val
          20             25             30

Thr His Leu Leu Ala Ile Phe Val Pro Met Ile Thr Pro Ala Leu Ile
      35             40             45

Val Gly Gly Ala Leu Glu Leu Pro Val Glu Met Thr Ala Tyr Leu Val
      50             55             60

Ser Met Ala Met Val Ala Ser Gly Val Gly Thr Tyr Leu Gln Val Asn
      65             70             75             80

Arg Phe Gly Pro Val Gly Ser Gly Met Leu Ser Ile Gln Ser Val Asn
          85             90             95

Phe Ser Phe Val Thr Val Met Ile Ala Leu Gly Ala Gly Met Lys Glu
      100            105            110

Gly Gly Leu Thr Lys Asp Ala Met Ile Ser Thr Leu Leu Gly Val Ser
      115            120            125

Phe Val Gly Ala Phe Leu Val Cys Phe Ser Ala Trp Leu Leu Pro Tyr
      130            135            140

Leu Lys Lys Val Ile Thr Pro Thr Val Ser Gly Val Val Val Met Leu
      145            150            155            160

Ile Gly Leu Ser Leu Val His Val Gly Ile Thr Asp Phe Gly Gly Gly
      165            170            175

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| | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | Gly | Ala | Lys | Ala | Asp | Gly | Thr | Phe | Gly | Ser | Met | Glu | Asn | Leu | Gly | 180 | 185 | 190 | |
| Leu | Ala | Ser | Leu | Val | Leu | Leu | Ile | Val | Leu | Val | Phe | Asn | Cys | Met | Lys | 195 | 200 | 205 | |
| Asn | Pro | Leu | Leu | Arg | Met | Ser | Gly | Ile | Ala | Val | Gly | Leu | Ile | Ala | Gly | 210 | 215 | 220 | |
| Tyr | Ile | Val | Ala | Leu | Phe | Leu | Gly | Lys | Val | Asp | Phe | Ser | Ala | Leu | Gln | 225 | 230 | 235 | 240 |
| Asn | Leu | Pro | Leu | Val | Thr | Leu | Pro | Val | Pro | Phe | Lys | Tyr | Gly | Phe | Ala | 245 | 250 | 255 | |
| Phe | Asp | Trp | His | Ala | Phe | Ile | Val | Ala | Gly | Ala | Ile | Phe | Leu | Leu | Ser | 260 | 265 | 270 | |
| Val | Phe | Glu | Ala | Val | Gly | Asp | Leu | Thr | Ala | Thr | Ala | Met | Val | Ser | Asp | 275 | 280 | 285 | |
| Gln | Pro | Ile | Glu | Gly | Glu | Glu | Tyr | Thr | Lys | Arg | Leu | Arg | Gly | Gly | Val | 290 | 295 | 300 | |
| Leu | Ala | Asp | Gly | Leu | Val | Ser | Val | Ile | Ala | Thr | Ala | Leu | Gly | Ser | Leu | 305 | 310 | 315 | 320 |
| Pro | Leu | Thr | Thr | Phe | Ala | Gln | Asn | Asn | Gly | Val | Ile | Gln | Met | Thr | Gly | 325 | 330 | 335 | |
| Val | Ala | Ser | Arg | His | Val | Gly | Lys | Tyr | Ile | Ala | Val | Ile | Leu | Val | Leu | 340 | 345 | 350 | |
| Leu | Gly | Leu | Phe | Pro | Val | Val | Gly | Arg | Ala | Phe | Thr | Thr | Ile | Pro | Ser | 355 | 360 | 365 | |
| Pro | Val | Leu | Gly | Gly | Ala | Met | Val | Leu | Met | Phe | Gly | Leu | Ile | Ala | Ile | 370 | 375 | 380 | |
| Ala | Gly | Val | Arg | Ile | Leu | Val | Ser | His | Gly | Ile | Arg | Arg | Arg | Glu | Ala | 385 | 390 | 395 | 400 |
| Val | Ile | Ala | Ala | Thr | Ser | Val | Gly | Leu | Gly | Leu | Gly | Val | Ala | Phe | Glu | 405 | 410 | 415 | |
| Pro | Glu | Val | Phe | Lys | Asn | Leu | Pro | Val | Leu | Phe | Gln | Asn | Ser | Ile | Ser | 420 | 425 | 430 | |
| Ala | Gly | Gly | Ile | Thr | Ala | Val | Leu | Leu | Asn | Leu | Val | Leu | Pro | Glu | Asp | 435 | 440 | 445 | |
| Lys | Thr | Glu | Ala | Ala | Val | Lys | Phe | Asp | Thr | Asp | His | Leu | Glu | His | | 450 | 455 | 460 | |

<210> 1543

<211> 789
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1543
 atgccctttc ccgttttcag acaantatatt gcttngtcct tgctacgggt ttttgccgta 60
 ggtcggattc tcgaatccga catttccaac agcgggtttt cggaaacgat aaacgcgtca 120
 aatgtttttt ttgtcggata cgaatatccg gcctgcattt caaattttaca tcgcttccaa 180
 tttcgaaaac ttggtatcca gttctttcac gccctgtttg ccgaagttga tggtcagtcg 240
 ggcggattcg cctttgtctg cggcatcgat aatcacgcgc gtgccgaatt tggcgtgacg 300
 gacgttttgt ccgatgcgga agcctgcgta ggtttgcggc tgtttgaagt catcgatgat 360
 tttgtcccgt tgtacgggtg tttggcgcgt gttgccgtag ctgtcgaagg cgggtttttt 420
 gacggacagg tagtgcaata cttctggcgg gatttcttcg acgaagcggg atgcgatgcc 480
 gaattgggtt tgtccgtgca gcatgcgttg ctgtgccatg gtgatgtaga ggcgtttgcg 540
 ggcgcgggtg atggcgacgt acatgaggcg gcgttcttct tcgaggccgc cgcgctcggc 600
 aaggctcatt tcgctgggga aacgcccctc ttccataccg gtgaggaaga cggcgttgaa 660
 ttccaagcct ttggcggcgt ggacgggtcat cagttggacg gctttttcgc ctgcccctgc 720
 ttggttttcg ccgatttcga gggcggcggt gctcaagaag gcgaggatgg ggaaggcggg 780
 atcgtctga 789

<210> 1544
 <211> 262
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1544
 Met Pro Phe Pro Val Phe Arg Gln Xaa Phe Ala Xaa Ser Leu Leu Arg
 1 5 10 15
 Phe Phe Ala Val Gly Arg Ile Leu Glu Ser Asp Ile Ser Asn Ser Gly
 20 25 30
 Phe Ser Glu Thr Ile Asn Ala Ser Asn Val Phe Phe Val Gly Tyr Glu
 35 40 45
 Tyr Pro Ala Cys Ile Ser Asn Leu His Arg Phe Gln Phe Arg Lys Leu
 50 55 60
 Gly Ile Gln Phe Phe His Ala Leu Phe Ala Glu Val Asp Gly Gln Ser
 65 70 75 80
 Gly Gly Phe Ala Phe Val Cys Gly Ile Asp Asn His Ala Gly Ala Glu
 85 90 95
 Phe Gly Val Thr Asp Val Leu Ser Asp Ala Glu Ala Cys Val Gly Leu
 100 105 110
 Arg Leu Phe Glu Val Ile Asp Asp Phe Val Pro Leu Tyr Gly Gly Leu
 115 120 125
 Ala Arg Val Ala Val Ala Val Glu Gly Gly Phe Phe Asp Gly Gln Val
 130 135 140
 Val Gln Tyr Phe Trp Arg Asp Phe Phe Asp Glu Ala Gly Cys Asp Ala
 145 150 155 160

Glu Leu Gly Leu Ser Val Gln His Ala Leu Leu Cys His Gly Asp Val
 165 170 175
 Glu Ala Phe Ala Gly Ala Gly Asp Gly Asp Val His Glu Ala Ala Phe
 180 185 190
 Phe Phe Glu Ala Ala Ala Leu Gly Lys Ala His Phe Ala Gly Glu Thr
 195 200 205
 Pro Leu Phe His Thr Gly Glu Glu Asp Gly Val Glu Phe Gln Ala Phe
 210 215 220
 Gly Gly Val Asp Gly His Gln Leu Asp Gly Phe Phe Ala Cys Pro Cys
 225 230 235 240
 Leu Val Phe Ala Gly Phe Glu Gly Gly Val Ala Gln Glu Gly Glu Asp
 245 250 255
 Gly Glu Gly Gly Ile Val
 260

<210> 1545
 <211> 786
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1545
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 aatgtttttg tcggatacga atatccgacc tacatttcaa atttacatct cttccaattt 180
 cgcaaacttg gtgtccaact ctttcacgcc ctgtttgccg aaattgatgg tcagtcgggc 240
 ggattcgcct ttatctgcgg catcgataat cacgccggtg ccgaatttgg cgtggcggac 300
 gttttgtccg atacggaaac ctgcgtaggt ttggggctgt ttgtagtcgt cgatgatttt 360
 atctttggat gcggcggttt ggcgcgtgtt gccgtaactg tcgtaggcag gctttttgac 420
 ggacaggtag tgcaataact cgggtgggat ctcttcgacg aagcgggaga cgatgccgaa 480
 ttgggtttgt ccgtgcagca tgcgttggtg cgccatggtg atgtagaggc gtttgcgggc 540
 gcgggtgatg gcgacgtaca tgaggcggcg ttcttcttcg aggccgccgc gttcggcaag 600
 gtcatttcg ctggggaagc ggccttcttc catgccggtg aggaagacgg cgttaaattc 660
 caagcctttg gcggcggtga cggtcatgag ttggacggcc ttttcgcctg cgcctgcctg 720
 gttttcacccg gattcgaggg cggcattgct taggaaggcg agaatgggga aggcgggggtc 780
 gtctga 786

<210> 1546
 <211> 261
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1546
 Met Pro Phe Pro Val Phe Arg Arg Pro Phe Ala Leu Ser Leu Leu Thr
 1 5 10 15
 Phe Phe Ala Val Ser Gln Ile Leu Val Ser Asp Ile Ser Asn Ser Gly
 20 25 30
 Val Ser Glu Thr Ile Asp Ala Ser Asn Val Phe Val Gly Tyr Glu Tyr

| 35 | | | | | 40 | | | | | 45 | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Pro | Thr | Tyr | Ile | Ser | Asn | Leu | His | Leu | Phe | Gln | Phe | Arg | Lys | Leu | Gly | |
| 50 | | | | | 55 | | | | | 60 | | | | | | |
| Val | Gln | Leu | Phe | His | Ala | Leu | Phe | Ala | Glu | Ile | Asp | Gly | Gln | Ser | Gly | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | |
| Gly | Phe | Ala | Phe | Ile | Cys | Gly | Ile | Asp | Asn | His | Ala | Gly | Ala | Glu | Phe | |
| 85 | | | | | 90 | | | | | 95 | | | | | | |
| Gly | Val | Ala | Asp | Val | Leu | Ser | Asp | Thr | Glu | Thr | Cys | Val | Gly | Leu | Gly | |
| 100 | | | | | 105 | | | | | 110 | | | | | | |
| Leu | Phe | Val | Val | Val | Asp | Asp | Phe | Ile | Phe | Gly | Cys | Gly | Gly | Leu | Ala | |
| 115 | | | | | 120 | | | | | 125 | | | | | | |
| Arg | Val | Ala | Val | Thr | Val | Val | Gly | Arg | Leu | Phe | Asp | Gly | Gln | Val | Val | |
| 130 | | | | | 135 | | | | | 140 | | | | | | |
| Gln | Tyr | Phe | Gly | Trp | Asp | Leu | Phe | Asp | Glu | Ala | Gly | Asp | Asp | Ala | Glu | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | |
| Leu | Gly | Leu | Ser | Val | Gln | His | Ala | Leu | Leu | Arg | His | Gly | Asp | Val | Glu | |
| 165 | | | | | 170 | | | | | 175 | | | | | | |
| Ala | Phe | Ala | Gly | Ala | Gly | Asp | Gly | Asp | Val | His | Glu | Ala | Ala | Phe | Phe | |
| 180 | | | | | 185 | | | | | 190 | | | | | | |
| Phe | Glu | Ala | Ala | Ala | Phe | Gly | Lys | Ala | His | Phe | Ala | Gly | Glu | Ala | Ala | |
| 195 | | | | | 200 | | | | | 205 | | | | | | |
| Phe | Phe | His | Ala | Gly | Glu | Glu | Asp | Gly | Val | Lys | Phe | Gln | Ala | Phe | Gly | |
| 210 | | | | | 215 | | | | | 220 | | | | | | |
| Gly | Val | Asp | Gly | His | Glu | Leu | Asp | Gly | Leu | Phe | Ala | Cys | Ala | Cys | Leu | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | |
| Val | Phe | Thr | Gly | Phe | Glu | Gly | Gly | Ile | Ala | Xaa | Glu | Gly | Glu | Asn | Gly | |
| 245 | | | | | 250 | | | | | 255 | | | | | | |
| Glu | Gly | Gly | Val | Val | | | | | | | | | | | | |
| 260 | | | | | | | | | | | | | | | | |

<210> 1547
 <211> 771
 <212> DNA
 <213> Neisseria meningitidis

<400> 1547
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 tacgagtatc cagcctgcat ttcaaattta catcgcttcc aatttcgcaa acttggtgtc 180
 caactctttc acgccctgtt tgccgaaatt gatggtcagt cgggcggatt cgcctttatc 240
 tgccgcatcg ataatcacgc cgggtgccga tttggcgtgg cggacgtttt gtccgatacg 300

gaaacctgcg taggtttggg gctgtttgta gtcgtcgatg attttgtctt tgggcgcggc 360
 ggtttggcgc gtgttgccat agcggtcgta ggcgggtttt ttgacggaca ggtagtgcaa 420
 tacttcgggc gggatttctt cgacgaagcg ggagacgatg ccgaattggg tttgtccgtg 480
 cagcatgcgt tgttgcgcca tggatgatga gaggcgtttg cgggcgcggg tgatggcgac 540
 gtacatcagg cggcgttctt cttcgaggcc gccgcgttcg gcaaggctca tttcgctggg 600
 gaagcggcct tcttccatgc cggtgaggaa tacggcggtta aattccaagc ctttggcggc 660
 gtgcacggtc atgagttgta cggctttttc gcccgcgccct gcttggtttt cgccggattc 720
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<210> 1548

<211> 255

<212> PRT

<213> *Neisseria meningitidis*

<400> 1548

Phe Arg Arg Pro Phe Ala Leu Ser Leu Leu Gln Phe Phe Ala Ile Gly
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Arg Ile Leu Glu Ser Asp Ile Ser Asn Ser Gly Phe Ser Glu Thr Ile
 20 25 30

Asp Ala Ser Asn Ile Phe Val Gly Tyr Glu Tyr Pro Ala Cys Ile Ser
 35 40 45

Asn Leu His Arg Phe Gln Phe Arg Lys Leu Gly Val Gln Leu Phe His
 50 55 60

Ala Leu Phe Ala Glu Ile Asp Gly Gln Ser Gly Gly Phe Ala Phe Ile
 65 70 75 80

Cys Gly Ile Asp Asn His Ala Gly Ala Glu Phe Gly Val Ala Asp Val
 85 90 95

Leu Ser Asp Thr Glu Thr Cys Val Gly Leu Gly Leu Phe Val Val Val
 100 105 110

Asp Asp Phe Val Phe Gly Arg Gly Gly Leu Ala Arg Val Ala Ile Ala
 115 120 125

Val Val Gly Gly Phe Phe Asp Gly Gln Val Val Gln Tyr Phe Gly Arg
 130 135 140

Asp Phe Phe Asp Glu Ala Gly Asp Asp Ala Glu Leu Gly Leu Ser Val
 145 150 155 160

Gln His Ala Leu Leu Arg His Gly Asp Val Glu Ala Phe Ala Gly Ala
 165 170 175

Gly Asp Gly Asp Val His Gln Ala Ala Phe Phe Phe Glu Ala Ala Ala
 180 185 190

Phe Gly Lys Ala His Phe Ala Gly Glu Ala Ala Phe Phe His Ala Gly
 195 200 205

Glu Glu Tyr Gly Val Lys Phe Gln Ala Phe Gly Gly Val His Gly His
 210 215 220

Glu Leu Tyr Gly Phe Phe Ala Arg Ala Cys Leu Val Phe Ala Gly Phe
 225 230 235 240

Glu Ser Ser Ile Ala Glu Ser Glu Asp Gly Glu Gly Gly Val Val
 245 250 255

<210> 1549

<211> 1281

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1549

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gacggcggcg atgcgctgca ctacctcaac cgcattccga cacaatacgg tttgcacgcg 180
ctggcacacg cgccggtttt ggaaaattcc gccgcaggc acgcacgcta tctcacgctc 240
aatcccgaag acggacacgg cgaacaccat cccgacaatc cgcactacac cgcacaaaag 300
ctgaccgaac gcacacgcct tgccgggtat ctctacaacg gcgtgcatga aaacatcagc 360
acggaagagg aagccgcca atcgtccgac agcgacatcc gcacgcagca acgccaagtg 420
gacgctttga tgagcgcaat ctaccaccgc ctttcgctgc ttgaccgcca taccgacgaa 480
gcaggcgcgg catttgctgc cgaaaacggc aaaaccgtcc tcgtattcaa tcagggaac 540
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taccgcaacg cttgccacaa cggcgcggcc gtttatgctg acgaagccat gcccgtaacg 660
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cagttcggca acagcctgtc catactccgg cacgaagcgg gcggcattgt cttcagcgctc 1200
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accctttatt tgcaggattg a                                     1281

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<210> 1550

<211> 426

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1550

Met Lys Ser Leu Phe Ile Trp Leu Leu Leu Gly Ser Ala Ala Gly
 1 5 10 15

Val Phe Tyr His Thr Gln Asn Gln Ser Leu Pro Ala Gly Glu Leu Val
 20 25 30

Tyr Pro Ser Ala Pro Gln Ile Arg Asp Gly Gly Asp Ala Leu His Tyr
 35 40 45

Leu Asn Arg Ile Arg Thr Gln Ile Gly Leu His Ala Leu Ala His Ala
 50 55 60

Pro Val Leu Glu Asn Ser Ala Arg Arg His Ala Arg Tyr Leu Thr Leu

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Asn | Pro | Glu | Asp | Gly | His | Gly | Glu | His | His | Pro | Asp | Asn | Pro | His | Tyr |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Thr | Ala | Gln | Lys | Leu | Thr | Glu | Arg | Thr | Arg | Leu | Ala | Gly | Tyr | Leu | Tyr |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Asn | Gly | Val | His | Glu | Asn | Ile | Ser | Thr | Glu | Glu | Glu | Ala | Ala | Glu | Ser |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ser | Asp | Ser | Asp | Ile | Arg | Thr | Gln | Gln | Arg | Gln | Val | Asp | Ala | Leu | Met |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Ser | Ala | Ile | Tyr | His | Arg | Leu | Ser | Leu | Leu | Asp | Arg | His | Thr | Asp | Glu |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Ala | Gly | Ala | Ala | Phe | Val | Arg | Glu | Asn | Gly | Lys | Thr | Val | Leu | Val | Phe |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Asn | Gln | Gly | Asn | Gly | Ser | Phe | Glu | Arg | Ala | Cys | Ala | Lys | Gly | Arg | Arg |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Gln | Pro | Glu | Ala | Gly | Arg | Lys | Tyr | Tyr | Arg | Asn | Ala | Cys | His | Asn | Gly |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Ala | Ala | Val | Tyr | Ala | Asp | Glu | Ala | Met | Pro | Val | Thr | Glu | Leu | Leu | Tyr |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Thr | Ala | Tyr | Pro | Val | Gly | Gly | Gly | Ala | Leu | Pro | Tyr | Phe | Tyr | Gly | Glu |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Arg | Pro | Asp | Pro | Val | Pro | Glu | Tyr | Glu | Ile | Thr | Gly | Asn | Pro | Ala | Ser |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Ile | Asp | Phe | Ser | Glu | Ala | Ala | Gly | Lys | Ile | Ala | Met | Lys | Ser | Phe | Lys |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Leu | Tyr | Gln | Gly | Lys | Asn | Glu | Ile | Arg | Pro | Val | Arg | Val | Leu | Thr | Ala |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Gly | Asn | Asp | Pro | Asn | Gly | Arg | Leu | Thr | Ala | His | Gln | Phe | Ala | Leu | Phe |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Pro | Leu | Lys | Pro | Leu | Glu | Tyr | Gly | Thr | Leu | Tyr | Thr | Ala | Val | Phe | Asp |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Tyr | Val | Arg | Asn | Gly | Arg | His | Ala | Gln | Ala | Lys | Trp | Gln | Phe | Arg | Thr |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Arg | Lys | Pro | Asp | Tyr | Pro | Tyr | Phe | Glu | Val | Asn | Gly | Gly | Glu | Thr | Leu |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Ala | Val | Arg | Lys | Gly | Glu | Lys | Tyr | Phe | Ile | His | Trp | Arg | Gly | Arg | Trp |
| | | 355 | | | | | 360 | | | | | 365 | | | |
| Cys | Leu | Glu | Ala | Cys | Thr | Arg | Tyr | Thr | Tyr | Arg | Arg | Gln | Phe | Gly | Asn |

370 375 380

Ser Leu Ser Ile Leu Arg His Glu Ala Gly Gly Ile Val Phe Ser Val
 385 390 395 400

Ser Gly Met Ala Gly Ser Arg Ile Arg Leu Thr Pro Glu Asp Ser Pro
 405 410 415

Glu Arg Gly Val Thr Leu Tyr Leu Gln Asp
 420 425

<210> 1551
 <211> 494
 <212> DNA
 <213> Neisseria meningitidis

<400> 1551
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 gacggcggcg atgcgctgca ctacctcaac cgcattccgag cccaaatcgg tttgcacaag 180
 ctggcacacg cgcgggtttt ggaaaactcc gccgcaggc acgcaagcta cctcacgctc 240
 aatcccgaag acggacacgg cgaacacccat cccgacaatc cgcactacac cgcacaaaag 300
 ctgaccgaac gcacacgcct tgccgggtat ctctacaacg gcgtgcatga aaacatcagc 360
 acggaagaag aagccgccga atcgtccgac agcgacatcc gcacgcagca acgccaagtg 420
 gacggattaa tgagcgcaat ctaccaccgc ctttccttac ttgaccgcca tacggatgag 480
 tcaggagcgg catt 494

<210> 1552
 <211> 164
 <212> PRT
 <213> Neisseria meningitidis

<400> 1552
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Val Phe Tyr His Thr Gln Xaa Gln Ser Leu Pro Ala Gly Glu Leu Val
 20 25 30

Tyr Pro Ser Ala Pro Gln Ile Arg Asp Gly Gly Asp Ala Leu His Tyr
 35 40 45

Leu Asn Arg Ile Arg Ala Gln Ile Gly Leu His Lys Leu Ala His Ala
 50 55 60

Pro Val Leu Glu Asn Ser Ala Arg Arg His Ala Ser Tyr Leu Thr Leu
 65 70 75 80

Asn Pro Glu Asp Gly His Gly Glu His His Pro Asp Asn Pro His Tyr
 85 90 95

Thr Ala Gln Lys Leu Thr Glu Arg Thr Arg Leu Ala Gly Tyr Leu Tyr
 100 105 110

Asn Gly Val His Glu Asn Ile Ser Thr Glu Glu Glu Ala Ala Glu Ser

115

120

125

Ser Asp Ser Asp Ile Arg Thr Gln Gln Arg Gln Val Asp Gly Leu Met
 130 135 140

Ser Ala Ile Tyr His Arg Leu Ser Leu Leu Asp Arg His Thr Asp Glu
 145 150 155 160

Ser Gly Ala Ala

<210> 1553

<211> 1281

<212> DNA

<213> Neisseria meningitidis

<400> 1553

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 gacggcggcg atgcgctgca ctacctcaac cgcattccgc cccaaatcgg tttgcacaag 180
 ctggcacacg cgccggtttt ggaaaattcc gccgcaggc acgcacgcta tctcacgctc 240
 aatcccgaag acggacacgg cgaacaccat cccgacaatc cgcactacac cgcacaaaag 300
 ctgaccgaac gcacacgcct tgccgggtat ctctacaacg gcgtgcatga aaacatcagc 360
 acggaagagg aagccgccga atcgtccgac agcgacatcc gcacgcagca acgccaagtg 420
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 cgaccgggca gccgcctgtc cataggaagg cacaaggcgg gcggcatcgt cttcagcggt 1200

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 accctttatt tacaggattg a 1281

<210> 1554

<211> 426

<212> PRT

<213> Neisseria meningitidis

<400> 1554

Met Lys Ser Leu Phe Ile Arg Leu Leu Leu Leu Gly Ser Ala Ala Gly
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 Val Phe Tyr His Thr Gln Asn Gln Ser Leu Pro Ala Gly Glu Leu Val
 20 25 30
 Tyr Pro Ser Ala Pro Gln Ile Arg Asp Gly Gly Asp Ala Leu His Tyr
 35 40 45

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|--|
| Leu | Asn | Arg | Ile | Arg | Ala | Gln | Ile | Gly | Leu | His | Lys | Leu | Ala | His | Ala | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Pro | Val | Leu | Glu | Asn | Ser | Ala | Arg | Arg | His | Ala | Arg | Tyr | Leu | Thr | Leu | | |
| | 65 | | | | 70 | | | | | 75 | | | | | | 80 | |
| Asn | Pro | Glu | Asp | Gly | His | Gly | Glu | His | His | Pro | Asp | Asn | Pro | His | Tyr | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | |
| Thr | Ala | Gln | Lys | Leu | Thr | Glu | Arg | Thr | Arg | Leu | Ala | Gly | Tyr | Leu | Tyr | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| Asn | Gly | Val | His | Glu | Asn | Ile | Ser | Thr | Glu | Glu | Glu | Ala | Ala | Glu | Ser | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Ser | Asp | Ser | Asp | Ile | Arg | Thr | Gln | Gln | Arg | Gln | Val | Asp | Gly | Leu | Met | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Ser | Ala | Ile | Tyr | His | Arg | Leu | Ser | Leu | Leu | Asp | Arg | His | Thr | Asp | Glu | | |
| | 145 | | | | 150 | | | | | 155 | | | | | 160 | | |
| Ala | Gly | Ala | Ala | Phe | Val | Arg | Glu | Asn | Gly | Lys | Thr | Val | Leu | Val | Phe | | |
| | | | | 165 | | | | | 170 | | | | | | 175 | | |
| Asn | Gln | Gly | Asn | Gly | Arg | Phe | Glu | Arg | His | Cys | Ala | Gln | Gly | Arg | Asn | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| Gln | Pro | Glu | Ala | Gly | Arg | Lys | Tyr | Tyr | Arg | Asn | Ala | Cys | His | Asn | Gly | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Ala | Val | Val | Tyr | Thr | Asp | Glu | Ala | Met | Pro | Ala | Gln | Glu | Leu | Leu | Tyr | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Thr | Ala | Tyr | Pro | Val | Gly | Asn | Gly | Ala | Leu | Pro | Tyr | Phe | His | Gly | Glu | | |
| | 225 | | | | 230 | | | | | 235 | | | | | 240 | | |
| Arg | Pro | Asp | Pro | Val | Pro | Glu | Tyr | Glu | Ile | Thr | Gly | Asn | Pro | Ala | Ser | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | |
| Ile | Asp | Phe | Ser | Glu | Ala | Ala | Gly | Lys | Ile | Thr | Met | Lys | Ser | Phe | Lys | | |
| | | | 260 | | | | | 265 | | | | | 270 | | | | |
| Leu | Tyr | Gln | Gly | Lys | Asn | Glu | Ile | Arg | Pro | Val | Arg | Val | Leu | Thr | Ala | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | |
| Gly | Asn | Asp | Pro | Asn | Gly | Arg | Leu | Thr | Ala | Tyr | Gln | Phe | Ala | Leu | Phe | | |
| | 290 | | | | | 295 | | | | | 300 | | | | | | |
| Pro | Leu | Lys | Pro | Leu | Glu | Tyr | Gly | Thr | Leu | Tyr | Thr | Ala | Val | Phe | Asp | | |
| | 305 | | | | 310 | | | | | 315 | | | | | 320 | | |
| Tyr | Val | Arg | Asn | Gly | Arg | Arg | Ala | Gln | Ala | Lys | Trp | Gln | Phe | Arg | Thr | | |
| | | | | 325 | | | | | 330 | | | | | 335 | | | |
| Arg | Lys | Pro | Asp | Tyr | Pro | Tyr | Phe | Glu | Val | Asn | Gly | Gly | Glu | Thr | Leu | | |
| | | | 340 | | | | | 345 | | | | | 350 | | | | |

Ala Val Arg Lys Gly Glu Lys Tyr Phe Ile His Trp Arg Gly Arg Trp
 355 360 365

Cys Leu Glu Ala Cys Thr Arg Tyr Thr Tyr Arg Gln Arg Pro Gly Ser
 370 375 380

Arg Leu Ser Ile Gly Arg His Lys Ala Gly Gly Ile Val Phe Ser Val
 385 390 395 400

Asp Gly Met Ala Gly Ser Arg Ile Thr Leu Ala Pro Glu Gly Glu Thr
 405 410 415

Glu Arg Gly Val Thr Leu Tyr Leu Gln Asp
 420 425

<210> 1555

<211> 1100

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1555

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 cagacggcat tggcggaagc cgtcgagctg gtcaaagcgg cggcgggcga ttccgtacgc 180
 gtggagactg ccaaacgcga ccgcccgcac actgcgctgt ttgtcggcac gggcaaggcg 240
 gcggagctgt cggaagcagt tgccgcagac ggcattgatt tggtcgtatt caaccacgaa 300

 ctactccca cgcaggaacg caatttgaa aaaatcctcc aatgccgcgt attggacaga 360
 gtggggtga ttctggcgat ttctgccgc cgcgcccgca cgcaggaagg caggctgcaa 420
 gtcaggttg cgcaattgag ccatttggcg ggacgcttga tacgcggtta cggacatttg 480
 caaagccagc gcggcggtat cggcatgaaa gggccgggcg aaaccaaact ggaaaccgac 540
 cgccgattaa ccgcccatcg gatcaacgcc ttgaaaaaac agcttgccaa cctcaaaaaa 600
 cagcgcgccc tgcgcgcgaa gtcccgcgag tcgggcagaa tcaaaacgtt tgcgctggtc 660
 ggctatacca atgtcggcaa atccagcctg ttcaaccggc tgaccaagtc gggcatatat 720
 gcgaaagacc agcttttcgc cactctcgac acgacggcgc ggcggctgta catcagtccc 780
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 gtcgatgctg ccgcccgaa cagcgggcag cagattgaag acgtggaaaa cgtactgcaa 960
 gaaatccatg cccacgatat tccgtgcac aaggtgtaca acaaaaccga cctgctgccg 1020
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<210> 1556

<211> 392

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1556

Met Ser Gly Arg Thr Gly Arg Asn Ser Ala Thr Gln Ala Gln Pro Glu
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Arg Val Met Leu Val Gly Val Met Leu Asp Lys Asp Asp Thr Gly Ser
 20 25 30

Asn Ala Ala Arg Leu Asn Gly Phe Gln Thr Ala Leu Ala Glu Ala Val
 35 40 45
 Glu Leu Val Lys Ala Ala Gly Gly Asp Ser Val Arg Val Glu Thr Ala
 50 55 60
 Lys Arg Asp Arg Pro His Thr Ala Leu Phe Val Gly Thr Gly Lys Ala
 65 70 75 80
 Ala Glu Leu Ser Glu Ala Val Ala Ala Asp Gly Ile Asp Leu Val Val
 85 90 95
 Phe Asn His Glu Leu Thr Pro Thr Gln Glu Arg Asn Leu Glu Lys Ile
 100 105 110
 Leu Gln Cys Arg Val Leu Asp Arg Val Gly Leu Ile Leu Ala Ile Phe
 115 120 125
 Ala Arg Arg Ala Arg Thr Gln Glu Gly Arg Leu Gln Val Glu Leu Ala
 130 135 140
 Gln Leu Ser His Leu Ala Gly Arg Leu Ile Arg Gly Tyr Gly His Leu
 145 150 155 160
 Gln Ser Gln Arg Gly Gly Ile Gly Met Lys Gly Pro Gly Glu Thr Lys
 165 170 175
 Leu Glu Thr Asp Arg Arg Leu Thr Ala His Arg Ile Asn Ala Leu Lys
 180 185 190
 Lys Gln Leu Ala Asn Leu Lys Lys Gln Arg Ala Leu Arg Arg Lys Ser
 195 200 205
 Arg Glu Ser Gly Arg Ile Lys Thr Phe Ala Leu Val Gly Tyr Thr Asn
 210 215 220
 Val Gly Lys Ser Ser Leu Phe Asn Arg Leu Thr Lys Ser Gly Ile Tyr
 225 230 235 240
 Ala Lys Asp Gln Leu Phe Ala Thr Leu Asp Thr Thr Ala Arg Arg Leu
 245 250 255
 Tyr Ile Ser Pro Ala Cys Ser Ile Ile Leu Thr Asp Thr Val Gly Phe
 260 265 270
 Val Ser Asp Leu Pro His Lys Leu Ile Ser Ala Phe Ser Ala Thr Leu
 275 280 285
 Glu Glu Thr Val Gln Ala Asp Val Leu Leu His Val Val Asp Ala Ala
 290 295 300
 Ala Arg Asn Ser Gly Gln Gln Ile Glu Asp Val Glu Asn Val Leu Gln
 305 310 315 320
 Glu Ile His Ala His Asp Ile Pro Cys Ile Lys Val Tyr Asn Lys Thr
 325 330 335

Asp Leu Leu Pro Ser Glu Glu Gln Asn Thr Gly Ile Trp Arg Asp Ala
 340 345 350

Ala Gly Lys Ile Ala Ala Val Arg Ile Ser Val Ala Glu Asn Thr Gly
 355 360 365

Ile Asp Ala Leu Arg Glu Ala Ile Ala Glu Tyr Cys Ala Ala Ala Pro
 370 375 380

Asn Thr Asp Glu Thr Glu Met Pro
 385 390

<210> 1557

<211> 1139

<212> DNA

<213> Neisseria meningitidis

<400> 1557

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 cagacggcat tggcggaagc tgtcgagctg gtcaaagcgg cgggcggcga ttccgtgctc 180
 gtggagactg ccaaacgcga ccgtccgcac accgcgctgt ttgtcggcac gggcaaggcg 240
 gcggagctgt cagaagcagt tgccgcagac ggcacgatt tggtcgtatt caaccacgaa 300
 ctacgcccc cgcaggaacg caaccttgaa aaagaactsa aatgccgcgt attggacagg 360
 gtagggctga ttctggcgat tttcgctcgc cgcgcccgca cgcaggaagg caggctgcaa 420
 gtcgagttgg cgcaattgag ccatttggcg ggacgcttga tacgcggtta cggccatctg 480
 cagagccagc gcggcggtat cggcatgaaa ggccccggcg aaaccaaact ggaaaccgac 540
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 cagcgcgccc tcgcccgaac gtncgcgcaa tcgggcacaa tcaaaacgtt tgcgctggtc 660
 ggctatacaa atgtcggaac atccagcctg ttcaaccggc tgacaaagtc gggcatatat 720
 gcaaaggaca agcttagtcc cgaatgcagc attatcctga ccgataccgt cggattcgtg 780
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 gaaaaattgc cgccgtccgc atttccgttg ctgaaaatac cggatatagac gcaactgcgc 1080
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<210> 1558

<211> 379

<212> PRT

<213> Neisseria meningitidis

<400> 1558

Met Thr Gly Arg Thr Gly Gly Asn Gly Ser Thr Gln Ala Gln Pro Glu
 1 5 10 15

Arg Val Met Leu Val Gly Val Met Leu Asp Lys Asp Gly Thr Gly Ser
 20 25 30

Ser Ala Ala Arg Leu Asn Gly Phe Gln Thr Ala Leu Ala Glu Ala Val
 35 40 45

Glu Leu Val Lys Ala Ala Gly Gly Asp Ser Val Arg Val Glu Thr Ala

| | | | | | | | | | | | | | | | |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 50 | | | | 55 | | | | 60 | | | | | | | |
| Lys 65 | Arg | Asp | Arg | Pro | His 70 | Thr | Ala | Leu | Phe | Val 75 | Gly | Thr | Gly | Lys | Ala 80 |
| Ala | Glu | Leu | Ser | Glu 85 | Ala | Val | Ala | Ala | Asp 90 | Gly | Ile | Asp | Leu | Val 95 | Val |
| Phe | Asn | His | Glu 100 | Leu | Thr | Pro | Thr | Gln 105 | Glu | Arg | Asn | Leu | Glu 110 | Lys | Glu |
| Leu | Lys | Cys 115 | Arg | Val | Leu | Asp | Arg 120 | Val | Gly | Leu | Ile | Leu 125 | Ala | Ile | Phe |
| Ala 130 | Arg | Arg | Ala | Arg | Thr | Gln 135 | Glu | Gly | Arg | Leu | Gln 140 | Val | Glu | Leu | Ala |
| Gln 145 | Leu | Ser | His | Leu 150 | Ala | Gly | Arg | Leu | Ile | Arg 155 | Gly | Tyr | Gly | His | Leu 160 |
| Gln | Ser | Gln | Arg | Gly 165 | Gly | Ile | Gly | Met | Lys 170 | Gly | Pro | Gly | Glu | Thr 175 | Lys |
| Leu | Glu | Thr | Asp 180 | Arg | Arg | Leu | Ile | Ala 185 | His | Arg | Ile | Asn 190 | Ala | Leu | Ile |
| Lys | Gln 195 | Leu | Ala | Asn | Leu | Lys 200 | Lys | Gln | Arg | Ala | Leu 205 | Arg | Arg | Lys | Ser |
| Arg 210 | Glu | Ser | Gly | Thr | Ile 215 | Lys | Thr | Phe | Ala | Leu 220 | Val | Gly | Tyr | Thr | Asn |
| Val 225 | Gly | Lys | Ser | Ser 230 | Leu | Phe | Asn | Arg | Leu 235 | Thr | Lys | Ser | Gly | Ile | Tyr 240 |
| Ala | Lys | Asp | Lys | Leu 245 | Ser | Pro | Glu | Cys | Ser 250 | Ile | Ile | Leu | Thr | Asp 255 | Thr |
| Val | Gly | Phe 260 | Val | Ser | Asp | Leu | Pro 265 | His | Lys | Leu | Ile | Ser 270 | Ala | Phe | Ser |
| Xaa 275 | Thr | Leu | Glu | Glu 280 | Thr | Ala | Gln | Ala | Asp | Val | Leu 285 | Leu | His | Val | Val |
| Asp 290 | Ala | Ala | Ala | Pro | Asn 295 | Ser | Gly | Gln | Gln | Ile 300 | Glu | Asp | Val | Glu | Asn |
| Val 305 | Leu | Gln | Glu | Ile 310 | His | Ala | Gly | Asp | Ile 315 | Pro | Cys | Ile | Lys | Val | Tyr 320 |
| Asn | Lys | Thr | Asp | Leu 325 | Leu | Pro | Ser | Glu | Glu 330 | Gln | Asn | Thr | Gly | Ile 335 | Trp |
| Arg | Asp | Ala 340 | Ala | Gly | Lys | Ile | Ala 345 | Ala | Val | Arg | Ile 350 | Ser | Val | Ala | Glu |
| Asn | Thr | Gly | Ile | Asp | Ala | Leu | Arg | Glu | Ala | Ile | Ala | Glu | Ser | Cys | Ala |

355

360

365

Ala Ala Pro Asn Thr Asp Glu Thr Glu Met Pro
370 375

<210> 1559

<211> 1179

<212> DNA

<213> Neisseria meningitidis

<400> 1559

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cagacggcat tggcggaagc tgtcgagctg gtcaaagcgg cgggcggcga ttccgtgctg 180
gtggagactg ccaaacgcga ccgtccgcac accgcgctgt ttgtcggcac gggcaaggcg 240
gcgagctgt cggaagcagt tgccgcagac ggcacgatt tggtcgtatt caaccacgaa 300
cttacgcca cgcaggaacg caatttgaa aaaatcctcc aatgccgct attggacaga 360
gtggggctga ttctggcgat tttcgccgc cgcgccgca cgcaggaagg caggctgcaa 420
gtcgagtgg cacaattgag ccatttggcg ggacgcttga tacgcggtta cggccatctg 480
cagaccagc gcggcggtat cggcatgaaa ggccccgcg aaaccaaact ggaaaccgac 540
cgccgattga tcgcccacgc gatcaatgcc ttgaaaaaac agcttgccaa cctcaaaaaa 600
cagcgcgccc tgcgcgcgaa gtccgcgcaa tcgggcacaa tcaaacggt tgcgctggtc 660
ggctatacca atgtcggcaa atccagctctg ttcaaccggc tgaccaagtc gggcatatat 720
gcgaaagacc agcttttcgc cacactcgac acgacggcgc ggcggtgta catcagtcct 780
gaatgcagca ttatcctgac cgataccgtc ggattcgtca gcgatctgcc gcacaaactg 840
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gtcgatgccg ccgctccgaa cagcggacag cagattgaag acgtggaaaa cgtactgcaa 960
gaaatccatg ccggcgatat tccgtgcac aaggtgtaca acaaaaccga cctgctgccg 1020
tctgaagaac aaaacacggg catatggcgc gacgtgcgg gaaaaattgc cgccgtccgc 1080
atttccgttg ctgaaaatac cggtatagac gcactgcgcg aagccattgc cgagtattgt 1140
gccgccgcac caaacacaga cgaaaccgaa atgccatga 1179

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<210> 1560

<211> 392

<212> PRT

<213> Neisseria meningitidis

<400> 1560

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Met Thr Gly Arg Thr Gly Arg Asn Gly Ser Thr Gln Ala Gln Pro Glu
 1           5           10           15

Arg Val Met Leu Val Gly Val Met Leu Asp Lys Asp Gly Thr Gly Ser
      20           25           30

Ser Ala Thr Arg Leu Asn Gly Phe Gln Thr Ala Leu Ala Glu Ala Val
      35           40           45

Glu Leu Val Lys Ala Ala Gly Gly Asp Ser Val Arg Val Glu Thr Ala
      50           55           60

Lys Arg Asp Arg Pro His Thr Ala Leu Phe Val Gly Thr Gly Lys Ala
      65           70           75           80

Ala Glu Leu Ser Glu Ala Val Ala Ala Asp Gly Ile Asp Leu Val Val
      85           90           95

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Phe Asn His Glu Leu Thr Pro Thr Gln Glu Arg Asn Leu Glu Lys Ile
100 105 110
Leu Gln Cys Arg Val Leu Asp Arg Val Gly Leu Ile Leu Ala Ile Phe
115 120 125
Ala Arg Arg Ala Arg Thr Gln Glu Gly Arg Leu Gln Val Glu Leu Ala
130 135 140
Gln Leu Ser His Leu Ala Gly Arg Leu Ile Arg Gly Tyr Gly His Leu
145 150 155 160
Gln Ser Gln Arg Gly Gly Ile Gly Met Lys Gly Pro Gly Glu Thr Lys
165 170 175
Leu Glu Thr Asp Arg Arg Leu Ile Ala His Arg Ile Asn Ala Leu Lys
180 185 190
Lys Gln Leu Ala Asn Leu Lys Lys Gln Arg Ala Leu Arg Arg Lys Ser
195 200 205
Arg Glu Ser Gly Thr Ile Lys Thr Phe Ala Leu Val Gly Tyr Thr Asn
210 215 220
Val Gly Lys Ser Ser Leu Phe Asn Arg Leu Thr Lys Ser Gly Ile Tyr
225 230 235 240
Ala Lys Asp Gln Leu Phe Ala Thr Leu Asp Thr Thr Ala Arg Arg Leu
245 250 255
Tyr Ile Ser Pro Glu Cys Ser Ile Ile Leu Thr Asp Thr Val Gly Phe
260 265 270
Val Ser Asp Leu Pro His Lys Leu Ile Ser Ala Phe Ser Ala Thr Leu
275 280 285
Glu Glu Thr Ala Gln Ala Asp Val Leu Leu His Val Val Asp Ala Ala
290 295 300
Ala Pro Asn Ser Gly Gln Gln Ile Glu Asp Val Glu Asn Val Leu Gln
305 310 315 320
Glu Ile His Ala Gly Asp Ile Pro Cys Ile Lys Val Tyr Asn Lys Thr
325 330 335
Asp Leu Leu Pro Ser Glu Glu Gln Asn Thr Gly Ile Trp Arg Asp Ala
340 345 350
Ala Gly Lys Ile Ala Ala Val Arg Ile Ser Val Ala Glu Asn Thr Gly
355 360 365
Ile Asp Ala Leu Arg Glu Ala Ile Ala Glu Tyr Cys Ala Ala Ala Pro
370 375 380
Asn Thr Asp Glu Thr Glu Met Pro
385 390

<210> 1561
 <211> 1149
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1561
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 gcgttctttt tggttggcgg ctctgatttt ttgctgctca tagggcgcg cggtgtagcc 180
 tgtctgccgg attttcaaca gaatgtcgga gaggcggatt ttgccgtcgt cccagacgac 240
 gcggcagcgg tgcgtgctgt aattgaggtc gatgcggacg atgccgtctg tgcgcaaaag 300
 ctgctgttcg atcagccaga cgcaggcggc gcaggtaatg ccgctgagca tcagcactgc 360
 ttcgtgcgtg ccattatggg tttccacaaa gtcggattgg acttcgggca ggtcgtacag 420
 gcggatttgg tcgaggattt cttggggcgg cagttcgggt ttttcgcgt cggcgggtgcg 480
 tcgtttgtaa taactgcccc agccggaatc gatgatgctt tgtgcgactg cctgacagcc 540
 gacgcagcag gtttcgcggg cttcgccttc gtagcggacg gtcagatgca ggttttcggg 600
 aacgtccagc ccgcagtgga aacaggtttt tttcatggca tttcggtttc gtctgtgttt 660
 ggtgcggcgg cacaatactc ggcaatggct tcgcgcagtg cgtctatacc ggtattttca 720
 gcaacggaaa tgcggacggc ggcaattttt cccgcagcgt cgcgccatat gcccggtgtt 780
 tgttcttcag acggcagcag gtcggttttg ttgtacacct tgatgcacgg aatatcgtgg 840
 gcatggattt cttgcagtac gttttccacg tcttcaatct gctgcccgtt gttccggggc 900
 gcagcatcga cgacgtgcag cagcacatcg gcttgcacgg tttcttccaa ggtggcggaa 960
 aaggcggaaa tcagtttggt cggcagatcg ctgacgaatc cgacgggtatc ggtcaggata 1020
 atgctgcatg cgggactgat gtacagccgc cgcgccgtcg tgctgagagt ggcgaaaagc 1080
 tggctcttcg catatatgcc cgacttggtc agccgggtga acaggctgga tttgccgaca 1140
 ttgtatag 1149

<210> 1562
 <211> 382
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1562
 Met Glu Asp Leu Gln Glu Ile Gly Phe Asp Val Ala Ala Val Lys Val
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 Gly Arg Gln Arg Glu His His Arg Leu His His Thr Gln Ser Gly Asn
 20 25 30
 Gly Lys Ala Asp Asp Val Leu Phe Ala Phe Phe Leu Val Gly Gly Phe
 35 40 45
 Asp Phe Leu Arg Val Ile Gly Cys Gly Gly Val Ala Cys Leu Pro Asp
 50 55 60
 Phe Gln Gln Asn Val Gly Glu Ala Asp Phe Ala Val Val Pro Asp Asp
 65 70 75 80
 Ala Ala Ala Val Arg Ala Val Ile Glu Val Asp Ala Asp Asp Ala Val
 85 90 95
 Cys Ala Gln Lys Leu Leu Phe Asp Gln Pro Asp Ala Gly Gly Ala Gly
 100 105 110

Asn Ala Ala Glu His Gln His Cys Phe Val Arg Ala Ile Met Gly Phe
 115 120 125
 His Lys Val Gly Leu Asp Phe Gly Gln Val Val Gln Ala Asp Leu Val
 130 135 140
 Glu Asp Phe Leu Gly Arg Gln Phe Gly Phe Phe Arg Val Gly Gly Ala
 145 150 155 160
 Ser Phe Val Ile Thr Ala Gln Ala Gly Ile Asp Asp Ala Leu Cys Asp
 165 170 175
 Cys Leu Thr Ala Asp Ala Ala Gly Phe Ala Val Phe Ala Phe Val Ala
 180 185 190
 Asp Gly Gln Met Gln Val Phe Gly Asn Val Gln Pro Ala Val Glu Thr
 195 200 205
 Gly Phe Phe His Gly Ile Ser Val Ser Ser Val Phe Gly Ala Ala Ala
 210 215 220
 Gln Tyr Ser Ala Met Ala Ser Arg Ser Ala Ser Ile Pro Val Phe Ser
 225 230 235 240
 Ala Thr Glu Met Arg Thr Ala Ala Ile Phe Pro Ala Ala Ser Arg His
 245 250 255
 Met Pro Val Phe Cys Ser Ser Asp Gly Ser Arg Ser Val Leu Leu Tyr
 260 265 270
 Thr Leu Met His Gly Ile Ser Trp Ala Trp Ile Ser Cys Ser Thr Phe
 275 280 285
 Ser Thr Ser Ser Ile Cys Cys Pro Leu Phe Arg Ala Ala Ala Ser Thr
 290 295 300
 Thr Cys Ser Ser Thr Ser Ala Cys Thr Val Ser Ser Lys Val Ala Glu
 305 310 315 320
 Lys Ala Glu Ile Ser Leu Cys Gly Arg Ser Leu Thr Asn Pro Thr Val
 325 330 335
 Ser Val Arg Ile Met Leu His Ala Gly Leu Met Tyr Ser Arg Arg Ala
 340 345 350
 Val Val Ser Arg Val Ala Lys Ser Trp Ser Phe Ala Tyr Met Pro Asp
 355 360 365
 Leu Val Ser Arg Leu Asn Arg Leu Asp Leu Pro Thr Leu Val
 370 375 380

<210> 1563

<211> 1035

<212> DNA

<213> Neisseria meningitidis

<400> 1563

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gcgttctttt tggttggcgg ctctgatttt ttgcgcgtca taggggtgcgg cgggtgtagcc 180
tatctgcctg attttcaaca gaatgtcggg aaggcggatt ttgccgtcgt ccagacgac 240
gcggcagcgg tgcgtgctgt aattgaggtc gatgcggacg atgccgtctg tacgcaaaag 300
ctgctgttcg atcagccaga cgcaggcggc gcagggtgat cgcgcgagca ttaaaaccgc 360
ctcgcgcgtg ccgccgtggg tttccacaaa gtcggactgg acttcgggca ggtcgtacag 420
gcggatttgg tcgaggattt cttggggcgg cagctcgggt ttttgcgcgt cggcgggtgcg 480
ttgtttgtaa taactgccc agcccgcgtc aataatgctt tgtgcgaccg cctgacagcc 540
ggcgcacagg gtttcgcggg ctctgttttc gtaacggaca gtcagggtga ggtgttcggg 600
aacatccaga ccgcagtga aacaggtttt ttcatggca tttcggtttc gtctgtgttt 660
ggtgcggcgg cacaagactc ggcaatggct tcgcgcagtg cgtctatacc ggtattttca 720
gcaacggaaa tgcggacggc ggcaattttt ccgcagcgt cgcgccatat gccgtgttt 780
tgttcttcag acggcagtag gtcgggtttt ttgtacacct tgatgcacgg aatatcgccg 840
gcatggattt cttgcagtac gttttccacg tcttcaatct gctgtccgct gttcggagcg 900
gcggcatcga cgacgtgcag cagcacatcg gcttgcgcgg tttcttcacg cgtggcgaaa 960
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tgctgcattc gggac 1035
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<210> 1564

<211> 344

<212> PRT

<213> Neisseria meningitidis

<400> 1564

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Met Glu Asp Leu Gln Glu Ile Gly Phe Asp Val Ala Ala Val Lys Val
  1             5             10             15

Gly Arg Gln Arg Glu His His Arg Leu His His Pro Gln Pro Gly Asn
      20             25             30

Gly Glu Ala Asp Asp Val Leu Phe Ala Phe Phe Leu Val Gly Gly Phe
      35             40             45

Asp Phe Leu Arg Val Ile Gly Cys Gly Gly Val Ala Tyr Leu Pro Asp
      50             55             60

Phe Gln Gln Asn Val Gly Lys Ala Asp Phe Ala Val Val Pro Asp Asp
      65             70             75             80

Ala Ala Ala Val Arg Ala Val Ile Glu Val Asp Ala Asp Asp Ala Val
      85             90             95

Cys Thr Gln Lys Leu Leu Phe Asp Gln Pro Asp Ala Gly Gly Ala Gly
      100            105            110

Asp Ala Ala Glu His Asn Arg Leu Ala Arg Ala Ala Val Gly Phe His
      115            120            125

Lys Val Gly Leu Asp Phe Gly Gln Val Val Gln Ala Asp Leu Val Glu
      130            135            140

Asp Phe Leu Gly Arg Gln Leu Gly Phe Leu Arg Val Gly Gly Ala Leu
      145            150            155            160
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Phe Val Ile Thr Ala Gln Ala Arg Val Asn Asn Ala Leu Cys Asp Arg
 165 170 175
 Leu Thr Ala Gly Ala Gln Gly Phe Ala Val Phe Val Phe Val Thr Asp
 180 185 190
 Ser Gln Val Glu Val Phe Gly Asn Ile Gln Thr Ala Val Glu Thr Gly
 195 200 205
 Phe Phe His Gly Ile Ser Val Ser Ser Val Phe Gly Ala Ala Ala Gln
 210 215 220
 Asp Ser Ala Met Ala Ser Arg Ser Ala Ser Ile Pro Val Phe Ser Ala
 225 230 235 240
 Thr Glu Met Arg Thr Ala Ala Ile Phe Pro Ala Ala Ser Arg His Met
 245 250 255
 Pro Val Phe Cys Ser Ser Asp Gly Ser Arg Ser Val Leu Leu Tyr Thr
 260 265 270
 Leu Met His Gly Ile Ser Pro Ala Trp Ile Ser Cys Ser Thr Phe Ser
 275 280 285
 Thr Ser Ser Ile Cys Cys Pro Leu Phe Gly Ala Ala Ala Ser Thr Thr
 290 295 300
 Cys Ser Ser Thr Ser Ala Cys Ala Val Ser Ser Ser Val Ala Xaa Lys
 305 310 315 320
 Ala Glu Ile Ser Leu Cys Gly Arg Ser Leu Thr Asn Pro Thr Val Ser
 325 330 335
 Val Arg Ile Met Leu His Ser Gly
 340

<210> 1565

<211> 1149

<212> DNA

<213> *Neisseria meningitidis*

<400> 1565

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 gcgttctttt tggttggcgg cttcgatttt ttgcgcgtca tagggtgcgg cgggtgtagcc 180
 tatctgcctg attttcaaca gaatgtcgga aaggcggatt ttgccgtcgt cccagacgac 240
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 ctgctgttct atcagccaga cgcaggcggc gcagggtgat ccgccgagca ttaaaaccgc 360
 ctgcgcgtg ccgccgtggg tttccacaaa gtcggactgg acttcgggca ggtcgtacag 420
 gcggatttgg tcgaggattt cttggggcgg cagctcggtt ttttgcgcgt cggcgggtgcg 480
 ttgtttgtaa taactgccc agcccgcgtc aataatgctt tgtgcgactg cctgacaacc 540
 ggcgagcag gtttcgcggg cttcgttttc gtaacggacg gtcagatgca ggttttcggg 600
 aacgtccagc ccgcagtgga aacaggtttt tttcatggca tttcggtttc gtctgtgttt 660
 ggtgcggcgg cacaatactc ggcaatggct tcgcgcagtg cgtctatacc ggtattttca 720
 gcaacggaat tgcggacggc ggcaattttt cccgcagcgt cgcgccatat gcccggtgttt 780


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tgttcttcag acggcagcag gtcggttttg ttgtacacct tgatgcacgg aatatcgccg 840
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gcggcacatga cgacgtgcag cagcacatcg gcttgcgcgg tttcttccag cgtggcggaa 960
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atgctgcatt cgggactgat gtacagccgc cgcgccgtcg tgtcgagtgt ggcgaaaagc 1080
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ttggtatag 1149

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<210> 1566

<211> 381

<212> PRT

<213> Neisseria meningitidis

<400> 1566

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Met Glu Asp Leu Gln Glu Ile Gly Phe Asp Val Ala Ala Val Lys Val
  1              5              10              15

Gly Arg Gln Arg Glu His His Arg Leu His His Pro Gln Pro Gly Asn
          20              25              30

Gly Glu Ala Asp Asp Val Leu Phe Ala Phe Phe Leu Val Gly Gly Phe
          35              40              45

Asp Phe Leu Arg Val Ile Gly Cys Gly Gly Val Ala Tyr Leu Pro Asp
          50              55              60

Phe Gln Gln Asn Val Gly Lys Ala Asp Phe Ala Val Val Pro Asp Asp
          65              70              75              80

Ala Ala Ala Val Arg Ala Val Ile Glu Val Asp Ala Asp Asp Ala Val
          85              90              95

Cys Thr Gln Lys Leu Leu Phe Asp Gln Pro Asp Ala Gly Gly Ala Gly
          100             105             110

Asp Ala Ala Glu His Asn Arg Leu Ala Arg Ala Ala Val Gly Phe His
          115             120             125

Lys Val Gly Leu Asp Phe Gly Gln Val Val Gln Ala Asp Leu Val Glu
          130             135             140

Asp Phe Leu Gly Arg Gln Leu Gly Phe Leu Arg Val Gly Gly Ala Leu
          145             150             155             160

Phe Val Ile Thr Ala Gln Ala Arg Val Asn Asn Ala Leu Cys Asp Cys
          165             170             175

Leu Thr Thr Gly Ala Ala Gly Phe Ala Val Phe Val Phe Val Thr Asp
          180             185             190

Gly Gln Met Gln Val Phe Gly Asn Val Gln Pro Ala Val Glu Thr Gly
          195             200             205

Phe Phe His Gly Ile Ser Val Ser Ser Val Phe Gly Ala Ala Ala Gln
          210             215             220

```

Tyr Ser Ala Met Ala Ser Arg Ser Ala Ser Ile Pro Val Phe Ser Ala
 225 230 235 240
 Thr Glu Met Arg Thr Ala Ala Ile Phe Pro Ala Ala Ser Arg His Met
 245 250 255
 Pro Val Phe Cys Ser Ser Asp Gly Ser Arg Ser Val Leu Leu Tyr Thr
 260 265 270
 Leu Met His Gly Ile Ser Pro Ala Trp Ile Ser Cys Ser Thr Phe Ser
 275 280 285
 Thr Ser Ser Ile Cys Cys Pro Leu Phe Gly Ala Ala Ala Ser Thr Thr
 290 295 300
 Cys Ser Ser Thr Ser Ala Cys Ala Val Ser Ser Ser Val Ala Glu Lys
 305 310 315 320
 Ala Glu Ile Ser Leu Cys Gly Arg Ser Leu Thr Asn Pro Thr Val Ser
 325 330 335
 Val Arg Ile Met Leu His Ser Gly Leu Met Tyr Ser Arg Arg Ala Val
 340 345 350
 Val Ser Ser Val Ala Lys Ser Trp Ser Phe Ala Tyr Met Pro Asp Leu
 355 360 365
 Val Ser Arg Leu Asn Arg Leu Asp Leu Pro Thr Leu Val
 370 375 380

<210> 1567

<211> 447

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1567

atgccgccct cccgacgcgg caacgggggtg ttttatcaaa acggcaaact tgccaatgcg 60
 gtttccgctt gccgattgcc aaaccggcaa acctttcccg tgccggtgcc gaaccgatg 120
 ccgtctgaac cttcagacgg catcgggtgt ttatttgtcc actcggacgg gtgcaggttc 180
 gtattgtgtc gattcgtcgc cgtaatacag cacgccgagt ttgacgggga tgcgtccctg 240
 cgatttgccg tgggcgttg aatcgcgcaa ggaatacgcg cagccgcagt attcctgctg 300
 gtagaagttt tcgcgtttgc tgatttcaat catacgcgcg ccgcgcgcgc ctttgcgcc 360
 gttgaagtcc caataggcca catcatcgta aggcgcggcg gcacggtgtc cgcagtcgtt 420
 gatttgcgcc atatttttcc agcgtga 447

<210> 1568

<211> 148

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1568

Met Pro Pro Ser Arg Arg Gly Asn Gly Val Phe Tyr Gln Asn Gly Lys
 1 5 10 15

Leu Ala Asn Ala Val Ser Ala Cys Arg Leu Pro Asn Arg Gln Thr Phe

| | | |
|---|-----|-----|
| 20 | 25 | 30 |
| Pro Val Pro Val Pro Asn Pro Met Pro Ser Glu Pro Ser Asp Gly Ile | | |
| 35 | 40 | 45 |
| Gly Cys Leu Phe Val His Ser Asp Gly Cys Arg Phe Val Leu Cys Arg | | |
| 50 | 55 | 60 |
| Phe Val Ala Val Ile Gln His Ala Glu Phe Asp Gly Asp Ala Ser Leu | | |
| 65 | 70 | 75 |
| Arg Phe Ala Val Gly Val Gly Ile Ala Gln Gly Ile Arg Ala Ala Ala | | |
| 85 | 90 | 95 |
| Val Phe Leu Leu Val Glu Val Phe Ala Phe Ala Asp Phe Asn His Thr | | |
| 100 | 105 | 110 |
| Arg Ala Ala Ala Ala Phe Ala Pro Val Glu Val Pro Ile Gly His Ile | | |
| 115 | 120 | 125 |
| Ile Val Arg Arg Gly Gly Thr Val Ser Ala Val Val Asp Leu Arg His | | |
| 130 | 135 | 140 |
| Ile Phe Pro Ala | | |
| 145 | | |

<210> 1569
 <211> 339
 <212> DNA
 <213> Neisseria meningitidis

<400> 1569
 ccgaaccgga tgccgtctga accttcagac ggcacgcggg gtttatttgt ccaccgggat 60
 gggggcagggt tcgtattgtg tcgattcgtc gccgtaatac agcacgccga gtttgatggg 120
 gattctgccc tgtgatttgc ggtgggcatt ggaatccctc aggggaatagg cacaaccgca 180
 atattcctgc tggtagaagt ttccacggtt gctgatttca atcatgcgcg cgctgccgcc 240
 gcctttgcgc cagttgaaat cccaatacac cacatcatcg taaggcgcgg cggcgcggtg 300
 tccgcagtcg ttgatttgcg ccatattttt ccagcgtga 339

<210> 1570
 <211> 111
 <212> PRT
 <213> Neisseria meningitidis

| |
|---|
| <400> 1570 |
| Pro Asn Pro Met Pro Ser Glu Pro Ser Asp Gly Ile Gly Cys Leu Phe |
| 1 5 10 15 |
| Val His Pro Asp Gly Gly Arg Phe Val Leu Cys Arg Phe Val Ala Val |
| 20 25 30 |
| Ile Gln His Ala Glu Phe Asp Gly Asp Ser Ala Leu Phe Ala Val Gly |
| 35 40 45 |
| Ile Gly Ile Pro Gln Gly Ile Gly Thr Thr Ala Ile Phe Leu Leu Val |

| | | |
|---|-----|---------|
| 50 | 55 | 60 |
| Glu Val Phe Thr Phe Ala Asp Phe Asn His Ala Arg Ala Ala Ala Ala | | |
| 65 | 70 | 75 80 |
| Phe Ala Pro Val Glu Ile Pro Ile His His Ile Ile Val Arg Arg Gly | | |
| | 85 | 90 95 |
| Gly Ala Val Ser Ala Val Val Asp Leu Arg His Ile Phe Pro Ala | | |
| | 100 | 105 110 |

<210> 1571
 <211> 441
 <212> DNA
 <213> Neisseria meningitidis

<400> 1571
 atgccgtcct cccgacgcgg caacgggggtg ttttatcaaa acggcaaact tgccaatgcg 60
 gtttccgatt gcagattgcc aaaccggcaa acctttcccg tgccgatgcc gaaccgatg 120
 ccgtctgaac cttcagacgg catcggggtg ttatttgtcc acccggatgg gtgcagggtc 180
 gtattgtgtc gattcgtcgc cgtaatacag caccgcgagt ttgatgggga ttctgccctg 240
 tgatttgagg tgggcggttg aatccctcag ggaataggca caaccgcaat attcctgctg 300
 gtagaagttt tcacgtttgc tgatttcaat catacgcgcg ctgccgccgc ctttgcgcca 360
 gttgaaatcc caatacacca catcatcgta aggcgcggcg gcgcggcggc cgcagtcgtt 420
 aatctgggtc atgtttttcc a 441

<210> 1572
 <211> 145
 <212> PRT
 <213> Neisseria meningitidis

<400> 1572
 Met Pro Ser Ser Arg Arg Gly Asn Gly Val Phe Tyr Gln Asn Gly Lys
 1 5 10 15
 Leu Ala Asn Ala Val Ser Asp Cys Arg Leu Pro Asn Arg Gln Thr Phe
 20 25 30
 Pro Val Pro Met Pro Asn Pro Met Pro Ser Glu Pro Ser Asp Gly Ile
 35 40 45
 Gly Cys Leu Phe Val His Pro Asp Gly Cys Arg Phe Val Leu Cys Arg
 50 55 60
 Phe Val Ala Val Ile Gln His Ala Glu Phe Asp Gly Asp Ser Ala Leu
 65 70 75 80
 Phe Ala Val Gly Val Gly Ile Pro Gln Gly Ile Gly Thr Thr Ala Ile
 85 90 95
 Phe Leu Leu Val Glu Phe Thr Phe Ala Asp Phe Asn His Thr Arg Ala
 100 105 110
 Ala Ala Ala Phe Ala Pro Val Glu Ile Pro Ile His His Ile Ile Val
 115 120 125

Arg Arg Gly Gly Ala Ala Ala Val Val Asn Leu Val His Val Phe
 130 135 140

Pro
 145

<210> 1573
 <211> 336
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1573
 atgccgaaat ggtcgcgcat acggcggttc agcgctcctt cgctgatgtt cagcgcggtt 60
 gtcagccggt tgacttggtg tgcgccgccg tcgaacgcgg cattcagggt gcggctgaag 120
 tcttcagacg gcatagcgtc tgcttcgccg gtttgccccg ccgccgggtc gatgccgtct 180
 gaaaccgtgt cccacaaatc cgacagcagc cgcaacacgt ccgcctcgcg gcgcaatgtt 240
 tcgccc aaat gcccttttg gacggtttgc aggcaggatg ccgccaagcc gcgcagggtt 300
 gggggcaaat cccatctct gaccggttcg cggtaa 336

<210> 1574
 <211> 111
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1574
 Met Pro Lys Trp Ser Arg Ile Arg Arg Cys Ser Val Leu Ser Leu Met
 1 5 10 15
 Phe Ser Ala Ala Val Ser Arg Leu Thr Trp Cys Ala Pro Pro Ser Asn
 20 25 30
 Ala Ala Phe Arg Val Arg Leu Lys Ser Ser Asp Gly Ile Ala Ser Ala
 35 40 45
 Ser Ala Val Cys Pro Ala Ala Gly Ser Met Pro Ser Glu Thr Val Ser
 50 55 60
 His Lys Ser Asp Ser Ser Arg Asn Thr Ser Ala Ser Arg Arg Asn Val
 65 70 75 80
 Ser Pro Lys Cys Pro Phe Gly Thr Val Cys Arg Gln Asp Ala Ala Lys
 85 90 95
 Pro Arg Arg Phe Gly Gly Lys Ser His Ile Leu Thr Gly Ser Arg
 100 105 110

<210> 1575
 <211> 335
 <212> DNA
 <213> Neisseria meningitidis

<400> 1575
 atgccgaaat ggtcgcgcat acggcggttc agcgctcctt cactgatgtt cagcgcggtt 60

gtcagccggt tgacttggtg tgcgccgtcg gcaaacgcgg catttagggt gcggctgaag 120
tcttcagacg gcatagcgtc tgcttccgcc gtttgccccg ccgccggccc gatgccgtct 180
gaaaccgtgt cccacaagtc cgacagcagc cgcaacacgt ccgcctcgcg cgcaatgttt 240
cgcccaaagt cccctttggg acggctttca ggcaggatgc cgccaagccg cgcaggttcg 300
ggggcaaatc ccatatcctg accggttcgc ggtaa 335

<210> 1576
<211> 121
<212> PRT
<213> Neisseria meningitidis

<400> 1576
Met Pro Lys Trp Ser Arg Ile Arg Arg Cys Ser Val Leu Ser Leu Met
1 5 10 15
Phe Ser Ala Ser Val Ser Arg Leu Thr Trp Cys Ala Pro Ser Ala Asn
20 25 30
Ala Ala Phe Arg Val Arg Leu Lys Ser Ser Asp Gly Ile Ala Ser Ala
35 40 45
Ser Ala Val Cys Pro Ala Ala Gly Pro Met Pro Ser Glu Thr Val Ser
50 55 60
His Lys Ser Asp Ser Ser Arg Asn Thr Ser Ala Ser Arg Ala Met Phe
65 70 75 80
Arg Pro Asn Ala Pro Leu Gly Arg Asn Val Ser Pro Lys Cys Pro Phe
85 90 95
Gly Thr Ala Phe Arg Gln Asp Ala Ala Lys Pro Arg Arg Phe Gly Gly
100 105 110
Lys Ser His Ile Leu Thr Gly Ser Arg
115 120

<210> 1577
<211> 336
<212> DNA
<213> Neisseria meningitidis

<400> 1577
atgccgaaat ggtcgcgcat acggcgttgc agcgtccttt cgctgatgtt cagcgtgtct 60
gccagccggt tgacttgatg tgcgccgccg gcaaacgcgg cattcaggat gcggctgaag 120
tcttcagacg gcatagcgtc tgcttccgcc gtttgccccg ccgccggccc gatgccgtct 180
gaaaccgtgt cccacaagtc cgacagcagc cgcaacacgt ccgcctcgcg gcgcaatgtt 240
tcgccccaat gcccttttgg gacggctttc aggcaggatg ccgccaaagcc gcgcaggttc 300
gggggcaaat cccatattct gaccggttcg cggtaa 336

<210> 1578
<211> 110
<212> PRT
<213> Neisseria meningitidis

<400> 1578

Met Pro Lys Trp Ser Arg Ile Arg Arg Cys Ser Val Leu Ser Leu Met
1 5 10 15

Phe Ser Val Ser Ala Ser Arg Leu Thr Cys Ala Pro Pro Ala Asn Ala
20 25 30

Ala Phe Arg Met Arg Leu Lys Ser Ser Asp Gly Ile Ala Ser Ala Ser
35 40 45

Ala Val Cys Pro Ala Ala Gly Pro Met Pro Ser Glu Thr Val Ser His
50 55 60

Lys Ser Asp Ser Ser Arg Asn Thr Ser Ala Ser Arg Arg Asn Val Ser
65 70 75 80

Pro Lys Cys Pro Phe Gly Thr Ala Phe Arg Gln Asp Ala Ala Lys Pro
85 90 95

Arg Arg Phe Gly Gly Lys Ser His Ile Leu Thr Gly Ser Arg
100 105 110

<210> 1579

<211> 1131

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1579

atggtttgtc ggttatttgc cgccgttttt ggctttcaac tcggcaatca gcccgctcgat 60
gcctttggct ttgatgattt cgccgaattg gttgcggtac acggtaacca ggctcgtgcc 120
ttcgatggcg acgttgtagg tacggtattt gccgcccgtt tggtaggtgg taaagtccat 180
attgacgggc ttctgaccgg ggatgccgac ttcggcacgg acgacgattt cttgcccgc 240
cttattgacg atgggattgt ctttgacgtt gacggtcgcg tttttgaatt tcagcatcgt 300
gccggaatag gtgcggatca gcagggtttg aaattctttg gccaacgctt gtttttgcgc 360
gtcggacgcg gtacgccaaag ggttgccgac cgccaatgcg gtcatacgtt ggaaatcgaa 420
atagggaacc gcataggctt cggtttttgg gcgtgcagaa gccgctcgc cgcttttgag 480
gatggtcaaa acctgtgtgg cgttttggcg gatttgtccc actgcgtcgg ccggggaggc 540
aaatgccatg ccgatgtcta aaataccgat gcccaatgcg ctgatgaagg aggatttttt 600
cacgatgtct ttctgaaaaa tggatgtgta tgtttattct gcggcttttt ccgcattgcc 660
gccctcagcg tttttctcgg cgaagctggt catgaattta ccgatcaggt tttccagaac 720
cattgcagaa ctggttacgg agatggtgtc gccggcagca aggttttccg tatcgccgcc 780
ctgctgcagc ccgatgtact gttcgcccaa aagtcgccga gtcaggattt gcgcggaaac 840
gtcactgctg aactgatact tgccgtccaa atcaaggcgc accctcgcct gataggattt 900
cgggtcaagc ccgatagcgc cgacgcgcc gaccaatacg cctgcggatt tgacgggggc 960
attgaccttc aaaccgccga tgtcgccgaa atcggcataa acggcgtaag ttttgtccga 1020
accgccgaac gccgcgccgc ccgccacgcg gaaagcgaga aaggcaaccg ccgccgcgcc 1080
gatcaagacg aacagtccga cccaaaattc caatatgttc tttttcatta a 1131

<210> 1580

<211> 376

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1580

Met Val Cys Arg Leu Phe Ala Ala Val Phe Gly Phe Gln Leu Gly Asn

| | | | |
|-----------------|-----------------|---------------------|---------------------|
| 1 | 5 | 10 | 15 |
| Gln Pro Val Asp | Ala Phe Gly Phe | Asp Asp Phe Ala Glu | Leu Val Ala |
| 20 | 25 | 30 | |
| Val His Gly Asn | Gln Ala Arg Ala | Phe Asp Gly Asp | Val Val Gly Thr |
| 35 | 40 | 45 | |
| Val Phe Ala Ala | Ala Leu Val Gly | Gly Lys Val His | Ile Asp Gly Leu |
| 50 | 55 | 60 | |
| Leu Thr Gly Asp | Ala Asp Phe Gly | Thr Asp Asp Asp | Phe Leu Ala Ala |
| 65 | 70 | 75 | 80 |
| Leu Ile Asp Asp | Gly Ile Val Phe | Asp Val Asp Gly | Arg Val Phe Glu |
| 85 | 90 | 95 | |
| Phe Gln His Arg | Ala Gly Ile Gly | Ala Asp Gln Gln | Gly Leu Lys Phe |
| 100 | 105 | 110 | |
| Phe Gly Gln Arg | Leu Phe Leu Arg | Val Gly Arg Gly | Thr Pro Arg Val |
| 115 | 120 | 125 | |
| Ala Asp Arg Gln | Cys Gly His Thr | Leu Glu Ile Glu | Ile Gly Asn Arg |
| 130 | 135 | 140 | |
| Ile Gly Phe Gly | Phe Trp Ala Cys | Arg Ser Arg Val | Ala Ala Phe Glu |
| 145 | 150 | 155 | 160 |
| Asp Gly Gln Asn | Leu Cys Gly Val | Leu Ala Asp Leu | Ser His Cys Val |
| 165 | 170 | 175 | |
| Gly Arg Gly Gly | Lys Cys His Ala | Asp Ala Gln Asn | Thr Asp Ala Gln |
| 180 | 185 | 190 | |
| Cys Ala Asp Glu | Gly Gly Phe Phe | His Asp Val Phe | Pro Glu Asn Gly |
| 195 | 200 | 205 | |
| Cys Val Cys Leu | Phe Cys Gly Phe | Phe Arg Ile Ala | Ala Ala Leu Ser Val |
| 210 | 215 | 220 | |
| Phe Leu Gly Glu | Ala Gly His Glu | Phe Thr Asp Gln | Val Phe Gln Asn |
| 225 | 230 | 235 | 240 |
| His Cys Arg Thr | Gly Tyr Gly Asp | Gly Val Ala Gly | Ser Lys Val Phe |
| 245 | 250 | 255 | |
| Arg Ile Ala Ala | Leu Leu Gln Pro | Asp Val Leu Phe | Ala Gln Lys Ser |
| 260 | 265 | 270 | |
| Arg Ser Gln Asp | Leu Arg Gly Asn | Val Thr Ala Glu | Leu Ile Leu Ala |
| 275 | 280 | 285 | |
| Val Gln Ile Lys | Ala His Pro Arg | Leu Ile Gly Phe | Arg Val Lys Pro |
| 290 | 295 | 300 | |
| Asp Ser Ala Asp | Ala Pro Asp Gln | Tyr Ala Cys Gly | Phe Asp Gly Gly |

Val Phe Thr Ala Ala Leu Val Gly Gly Glu Val His Val Asp Gly Phe
50 55 60
Leu Pro Gly Tyr Ala Asp Phe Gly Ala Asp Asp Asp Phe Phe Ala Ala
65 70 75 80
Phe Ile Asp Asp Gly Ile Val Phe Asp Val Asp Val Gly Val Phe Xaa
85 90 95
Phe Gln His Arg Ala Gly Ile Gly Ala Asp Gln Gln Gly Leu Lys Phe
100 105 110
Phe Gly Gln Arg Leu Phe Leu Arg Val Gly Arg Gly Ala Pro Arg Val
115 120 125
Ala Asp Arg Gln Cys Gly His Thr Leu Glu Ile Glu Ile Gly Asn Arg
130 135 140
Ile Gly Phe Gly Phe Leu Ala Ser Gly Val Gly Ile Ala Val Phe Xaa
145 150 155 160
Asp Ala Gln Tyr Leu Ser Gly Val Leu Thr Asp Leu Ala Tyr Arg Val
165 170 175
Gly Arg Gly Gly Lys Cys His Ala Asp Ala Gln Asn Thr Asp Ala Gln
180 185 190
Cys Ala Asp Glu Gly Gly Phe Phe His Asp Xaa Val Ser Xaa Phe Glu
195 200 205
Tyr Asp Gly Ile Arg Leu Phe Gly Gly Phe Phe Arg Ile Ala Ala Val
210 215 220
Gly Ile Phe Leu Gly Lys Thr Arg His Glu Phe Ala Asp Lys Val Phe
225 230 235 240
Gln Asn His Cys Arg Thr Gly Tyr Gly Asp Gly Val Ala Gly Ser Lys
245 250 255
Val Phe Arg Val Ala Ala Leu Leu Gln Pro Asp Val Leu Leu Ala Gln
260 265 270
Lys Ser Arg Ser Gln Asp Leu Arg Gly Asn Val Ala Ala Glu Leu Ile
275 280 285
Leu Ala Val Gln Ile Glu Ala His Pro Arg Leu Ile Gly Phe Arg Val
290 295 300
Lys Ser Asp Ser Ala Asp Ala Pro Asp Gln Tyr Ala Cys Gly Phe Asp
305 310 315 320
Gly Gly Ile Asp Leu Gln Thr Ala Asp Val Ala Glu Ile Gly Ile Asn
325 330 335
Gly Val Ser Phe Val Arg Thr Ala Glu Arg Arg Thr Ala Gly His Ala
340 345 350

Glu Ser Glu Lys Gly Asn Arg Arg Arg Ala Asn Gln Asp Glu Gln Ser
 355 360 365

Asp Pro Lys Phe Gln Tyr Val Leu Leu His
 370 375

<210> 1583
 <211> 1137
 <212> DNA
 <213> Neisseria meningitidis

<400> 1583
 atggcttatg gattacttgc tgccgtttnt agccttcaac tcgncaatca gtccgtccac 60
 gcctttcgct ttgataatth cgccgaattg gttgcggtac acggtaacca ggctcgcgcc 120
 ttcgatggcg acgttgtagg tacggtatth accgcccgtt tggtaggtgg tgaagtccat 180
 gttgacgggt ttttgcccg nnacgccgac ttcggcgcgg acgatgattt ctttgccgcc 240
 tttattgacg atnggattgt ctttgacgtt gacgttggcg ttttttaatt tcagcatcgt 300
 gccggaatag gtgcggatca gcagggtttg aaattccttg gccaacgctt gtttttgccg 360
 gtgcggacgg gtgcgccaa ggttgccgac cgccaatgcg gtcatacgtt ggaaatcgaa 420
 atagggaatc gcataggctt cggctttttg gcgggcgggtg ttggcatcac cgctttttta 480
 gatgctcaat acttgagtgg cgttttgacg gattttggtt accgcgtcgg caggggcggc 540
 aaatgccatg ccgatgctca aaataccgat gcccaatgcg ctgatgaagg aggatttttt 600
 catgattaag tgccttagtt tgaatatgat ggcatacgtt tattcggcgg ctttttccgc 660
 attgccgcgg tcggcatttt tctcggcaaa actcgtcatg aatttgccga taaggttttc 720
 cagaaccatt gcagaactgg ttacggagat ggtgtcgcgg gcagcaagggt tttccgtgtc 780
 gccgcccctg tgcagcccga tgtactgctc gcccaaaagt cccgaagtca ggatttgccg 840
 ggaaacgtcg ctgctgaact gatacttgcc gtccaaatcg aggcgcaccc tcgcctgata 900
 ggatttcggg tcaagtccga tagcgcggac gcgcccgaac aatacgccctg cggatttgac 960
 gggggcattg accttcaaac cgccgatgtc gccgaaatcg gcataaacgg cgtaagtttt 1020
 gtccgaaccg ccgaacgccg caccgccggc cacgcggaaa gcgagaaaagg caaccgccgc 1080
 cgcgccaatc aggacgaaca gtccgaccca aaattccaat atgttctttt tcattaa 1137

<210> 1584
 <211> 374
 <212> PRT
 <213> Neisseria meningitidis

<400> 1584
 Met Ala Tyr Gly Leu Leu Ala Ala Val Xaa Ser Leu Gln Leu Xaa Asn
 1 5 10 15
 Gln Ser Val His Ala Phe Arg Phe Asp Asn Phe Ala Glu Leu Val Ala
 20 25 30
 Val His Gly Asn Gln Ala Arg Ala Phe Asp Gly Asp Val Val Gly Thr
 35 40 45
 Val Phe Thr Ala Ala Leu Val Gly Gly Glu Val His Val Asp Gly Phe
 50 55 60
 Leu Pro Gly Xaa Ala Asp Phe Gly Ala Asp Asp Phe Phe Ala Ala
 65 70 75 80
 Phe Ile Asp Asp Xaa Ile Val Phe Asp Val Asp Val Gly Val Phe Phe
 85 90 95

Gln His Arg Ala Gly Ile Gly Ala Asp Gln Gln Gly Leu Lys Phe Phe
 100 105 110
 Gly Gln Arg Leu Phe Leu Arg Val Gly Arg Gly Ala Pro Arg Val Ala
 115 120 125
 Asp Arg Gln Cys Gly His Thr Leu Glu Ile Glu Ile Gly Asn Arg Ile
 130 135 140
 Gly Phe Gly Phe Leu Ala Gly Gly Val Gly Ile Thr Ala Phe Asp Ala
 145 150 155 160
 Gln Tyr Leu Ser Gly Val Leu Thr Asp Leu Val Tyr Arg Val Gly Arg
 165 170 175
 Gly Gly Lys Cys His Ala Asp Ala Gln Asn Thr Asp Ala Gln Cys Ala
 180 185 190
 Asp Glu Gly Gly Phe Phe His Asp Val Ser Phe Glu Tyr Asp Gly Ile
 195 200 205
 Arg Leu Phe Gly Gly Phe Phe Arg Ile Ala Ala Val Gly Ile Phe Leu
 210 215 220
 Gly Lys Thr Arg His Glu Phe Ala Asp Lys Val Phe Gln Asn His Cys
 225 230 235 240
 Arg Thr Gly Tyr Gly Asp Gly Val Ala Gly Ser Lys Val Phe Arg Val
 245 250 255
 Ala Ala Leu Leu Gln Pro Asp Val Leu Leu Ala Gln Lys Ser Arg Ser
 260 265 270
 Gln Asp Leu Arg Gly Asn Val Ala Ala Glu Leu Ile Leu Ala Val Gln
 275 280 285
 Ile Glu Ala His Pro Arg Leu Ile Gly Phe Arg Val Lys Ser Asp Ser
 290 295 300
 Ala Asp Ala Pro Asp Gln Tyr Ala Cys Gly Phe Asp Gly Gly Ile Asp
 305 310 315 320
 Leu Gln Thr Ala Asp Val Ala Glu Ile Gly Ile Asn Gly Val Ser Phe
 325 330 335
 Val Arg Thr Ala Glu Arg Arg Thr Ala Gly His Ala Glu Ser Glu Lys
 340 345 350
 Gly Asn Arg Arg Arg Ala Asn Gln Asp Glu Gln Ser Asp Pro Lys Phe
 355 360 365
 Gln Tyr Val Leu Phe His
 370

<210> 1585

<211> 489
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1585
 atgaaaaaaa tactcaccgc cgccgcccgtc gcaactgatcg gcatcctcct cgccaccgtc 60
 ctcatccccg acagtaaaac cgcgcccgcc ttctccctgc ccgacctgca cggaataaac 120
 gtttccaacg ccgacctgca aggcaaagtc accctgatta atttttggtt tccctcctgt 180
 ccgggttggtg tgagcgaaat gcccaaagtc accaaaacgg caaacgacta caaaaataaa 240
 gatttccaag tctcgcgcgt tgcccagccc atcgatccga tagaaagcgt ccgccaatac 300
 gtcaaagact acggactgcc gtttaccgtc atttatgatg cggacaaagc cgtcggacag 360
 gcattcggca cacagggtta tccgacttcc gtccttatcg gcaaaaaagg cgaaatcctc 420
 aaaacttatg tcggcgaacc cgatttcggc aaactctacc aagaaatcga taccgcgctg 480
 gcgcaatag 489

<210> 1586
 <211> 162
 <212> PRT
 <213> *Neisseria gonorrhoeae*

<400> 1586
 Met Lys Lys Ile Leu Thr Ala Ala Ala Val Ala Leu Ile Gly Ile Leu
 1 5 10 15
 Leu Ala Thr Val Leu Ile Pro Asp Ser Lys Thr Ala Pro Ala Phe Ser
 20 25 30
 Leu Pro Asp Leu His Gly Lys Thr Val Ser Asn Ala Asp Leu Gln Gly
 35 40 45
 Lys Val Thr Leu Ile Asn Phe Trp Phe Pro Ser Cys Pro Gly Cys Val
 50 55 60
 Ser Glu Met Pro Lys Val Thr Lys Thr Ala Asn Asp Tyr Lys Asn Lys
 65 70 75 80
 Asp Phe Gln Val Leu Ala Val Ala Gln Pro Ile Asp Pro Ile Glu Ser
 85 90 95
 Val Arg Gln Tyr Val Lys Asp Tyr Gly Leu Pro Phe Thr Val Ile Tyr
 100 105 110
 Asp Ala Asp Lys Ala Val Gly Gln Ala Phe Gly Thr Gln Val Tyr Pro
 115 120 125
 Thr Ser Val Leu Ile Gly Lys Lys Gly Glu Ile Leu Lys Thr Tyr Val
 130 135 140
 Gly Glu Pro Asp Phe Gly Lys Leu Tyr Gln Glu Ile Asp Thr Ala Leu
 145 150 155 160
 Ala Gln

<210> 1587
 <211> 489
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1587
 atgawaaaaa tactcaccgc cgccgctcgtc gcaactgatcg gcatcctcct tgccatcgtc 60
 ctcmcccccg acagcaaaac cgcgcccgcc ttctccmtgc ccgacctgca cggaaaaacc 120
 gtttccaacg ccgacctgca aggcaaagta accctgatta atttttggtt tccctcctgt 180
 ccgggttggtg tgagcgawat gcccaaaatc attaaaaacg caaatgacta taaaawcaaa 240
 aacttccaag tacttgccgt cgcccagccc atcgatccga tagaaagcgt ccgccaatat 300
 gtcaaagact acggtttgcc gtttaccgtc atgtatgatg cggacaaagc tgtcggacag 360
 gcgttcggca cacaggttta tccgacttcc gtccttatcg gcaaataagg cgaaatcttc 420
 aaaacctacg tcggcgaacc cgatttcggc aaactctacc aagaaatcga tacgcgcgtg 480
 gcgcaatag 489

<210> 1588
 <211> 161
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1588
 Met Xaa Lys Ile Leu Thr Ala Ala Val Val Ala Leu Ile Gly Ile Leu
 1 5 10 15
 Leu Ala Ile Val Leu Xaa Pro Asp Ser Lys Thr Ala Pro Ala Phe Ser
 20 25 30
 Xaa Pro Asp Leu His Gly Lys Thr Val Ser Asn Ala Asp Leu Gln Gly
 35 40 45
 Lys Val Thr Leu Ile Asn Phe Trp Phe Pro Ser Cys Pro Gly Cys Val
 50 55 60
 Ser Xaa Met Pro Lys Ile Ile Lys Thr Ala Asn Asp Tyr Lys Xaa Lys
 65 70 75 80
 Asn Phe Gln Val Leu Ala Val Ala Gln Pro Ile Asp Pro Ile Glu Ser
 85 90 95
 Val Arg Gln Tyr Val Lys Asp Tyr Gly Leu Pro Phe Thr Val Met Tyr
 100 105 110
 Asp Ala Asp Lys Ala Val Gly Gln Ala Phe Gly Thr Gln Val Tyr Pro
 115 120 125
 Thr Ser Val Leu Ile Gly Lys Gly Glu Ile Phe Lys Thr Tyr Val Gly
 130 135 140
 Glu Pro Asp Phe Gly Lys Leu Tyr Gln Glu Ile Asp Thr Arg Val Ala
 145 150 155 160
 Gln

<210> 1589
 <211> 489
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1589
 atgaaaaaaa tactcaaccgc cgccgctcgtc gcactgatcg gcatcctcct tgccatcgtc 60
 ctcacccccg acagcaaaac cgcgcccgct ttctccctgt ccganctgca cgaaaaaanc 120
 gtttncaacg ccgacctgca aggcnaagtt ancctgatta anttttggtt tccctcctgt 180
 ccgggttggtg tgagcgaaat gnccanaatc attaaaacgg caaatgacta taaaaacaaa 240
 aacttccaag tccttgccgt cgcccagccc atcgatccga tagaaagcgt ccgccaatat 300
 gtcaaagact acggtttgcc gtttaccgtc atgtatgatg cggacaaagc tgtcggacag 360
 gcgttcggca cacaggttta tccgacttcc gtccttatcg gcaaaaaagg cgaaatcctc 420
 aaaacttatg tcggcgaacc cgatttcggc aaactctacc aagaaatcga taccgcgctg 480
 gcacaatag 489

<210> 1590
 <211> 162
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1590
 Met Lys Lys Ile Leu Thr Ala Ala Val Val Ala Leu Ile Gly Ile Leu
 1 5 10 15
 Leu Ala Ile Val Leu Ile Pro Asp Ser Lys Thr Ala Pro Ala Phe Ser
 20 25 30
 Leu Ser Xaa Leu His Gly Lys Xaa Val Xaa Asn Ala Asp Leu Gln Gly
 35 40 45
 Xaa Val Xaa Leu Ile Xaa Phe Trp Phe Pro Ser Cys Pro Gly Cys Val
 50 55 60
 Ser Glu Met Xaa Xaa Ile Ile Lys Thr Ala Asn Asp Tyr Lys Asn Lys
 65 70 75 80
 Asn Phe Gln Val Leu Ala Val Ala Gln Pro Ile Asp Pro Ile Glu Ser
 85 90 95
 Val Arg Gln Tyr Val Lys Asp Tyr Gly Leu Pro Phe Thr Val Met Tyr
 100 105 110
 Asp Ala Asp Lys Ala Val Gly Gln Ala Phe Gly Thr Gln Val Tyr Pro
 115 120 125
 Thr Ser Val Leu Ile Gly Lys Lys Gly Glu Ile Leu Lys Thr Tyr Val
 130 135 140
 Gly Glu Pro Asp Phe Gly Lys Leu Tyr Gln Glu Ile Asp Thr Ala Leu
 145 150 155 160
 Ala Gln

<210> 1591
 <211> 426
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1591
 atgttcgtag ataacggatt taataaaacg gtagcgagtt ttgcccaaact cgtcgaaaact 60
 ttcgacgtat tcttcttttag gaacgattgc gcctttttta cgcagatgaa acagcgggtgc 120
 gggttggtct gctcgttggg atattctcgtt gatatatatta caagatgcgg cttcgagatt 180
 ccgaaccgct cctttaaaga gcttgggctt ttgatacaga taagtctgtc ggaacgtttt 240
 aggactaatg ccgaagtcga gatggatgcc cattacttcc cttactcag aaaatatatta 300
 aaatttataa tgttacatat agttacaaat attagagttt tttgtgtgtg cgtcaaggaa 360
 ttgttgacaa ttttagttaa aaatttgtct ccaaacggaa aaaagcgggt tgttttttgt 420
 tgtaa 426

<210> 1592
 <211> 141
 <212> PRT
 <213> *Neisseria gonorrhoeae*

<400> 1592
 Met Phe Val Asp Asn Gly Phe Asn Lys Thr Val Ala Ser Phe Ala Gln
 1 5 10 15
 Ile Val Glu Thr Phe Asp Val Phe Phe Phe Arg Asn Asp Cys Ala Phe
 20 25 30
 Phe Thr Gln Met Lys Gln Arg Cys Gly Trp Val Cys Ser Leu Val Tyr
 35 40 45
 Leu Val Asp Ile Phe Thr Arg Cys Gly Phe Glu Ile Pro Asn Arg Ser
 50 55 60
 Phe Lys Glu Leu Gly Leu Leu Ile Gln Ile Ser Leu Ser Glu Arg Phe
 65 70 75 80
 Arg Thr Asn Ala Glu Val Glu Met Asp Ala His Tyr Phe Pro Leu Leu
 85 90 95
 Arg Lys Tyr Leu Lys Phe Ile Met Leu His Ile Val Thr Asn Ile Arg
 100 105 110
 Val Phe Cys Val Cys Val Lys Glu Leu Leu Thr Ile Leu Val Lys Asn
 115 120 125
 Leu Ser Pro Asn Gly Lys Lys Arg Phe Val Phe Cys Cys
 130 135 140

<210> 1593
 <211> 429
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1593
 atgttcgtag ataacggatt taataaaacg gtagcgagtt ttgcccaaact cgtcgaaaact 60

ttcgacgtat tcttcttttag gaacgattgc gcctttttta cgcagatgaa acagcgggtgc 120
 gggtgggtct gctcgttggg atatctcgtt gatatctttc caagatgcgg attcgagatt 180
 ccgaaccgct cctttaaaga gcttgggctt ttgatacaga taagtctgtc ggaacgtttt 240
 aggactaatg ccgaagtcga gatggatgct cactacttcc ccttactcag aaaatattta 300
 aaatttataa tgttacatat atttaciaaat attaaagttt tttwttgtgt gtgcgtcaag 360
 gaattgttga caatttttagt taaaaatttg tctccaaacg gaaaaaagcg gtttggtttt 420
 tgttgttaa 429

<210> 1594
 <211> 142
 <212> PRT
 <213> Neisseria meningitidis

<400> 1594
 Met Phe Val Asp Asn Gly Phe Asn Lys Thr Val Ala Ser Phe Ala Gln
 1 5 10 15
 Ile Val Glu Thr Phe Asp Val Phe Phe Phe Arg Asn Asp Cys Ala Phe
 20 25 30
 Phe Thr Gln Met Lys Gln Arg Cys Gly Trp Val Cys Ser Leu Val Tyr
 35 40 45
 Leu Val Asp Ile Phe Pro Arg Cys Gly Phe Glu Ile Pro Asn Arg Ser
 50 55 60
 Phe Lys Glu Leu Gly Leu Leu Ile Gln Ile Ser Leu Ser Glu Arg Phe
 65 70 75 80
 Arg Thr Asn Ala Glu Val Glu Met Asp Ala His Tyr Phe Pro Leu Leu
 85 90 95
 Arg Lys Tyr Leu Lys Phe Ile Met Leu His Ile Phe Thr Asn Ile Lys
 100 105 110
 Val Phe Xaa Cys Val Cys Val Lys Glu Leu Leu Thr Ile Leu Val Lys
 115 120 125
 Asn Leu Ser Pro Asn Gly Lys Lys Arg Phe Val Phe Cys Cys
 130 135 140

<210> 1595
 <211> 380
 <212> DNA
 <213> Neisseria meningitidis

<400> 1595
 atgttcgtag ataacggatt taataaaacg gtagcgagtt ttgcccaaact cgtcgaaact 60
 ttcgacgtat tcttcttttag gaacaattgc acctttttta cgcagatgaa acagcgggtgc 120
 gggtgggtct gctcgttggg atatctcgtt gatatctttc caagatgcgg cttcgagatt 180
 ccgaaccgct cctttaaaga gcttgggctt ttgatacaga taagtctgtc ggaacgtttt 240
 aggactaatg ccgaagtcga gatagatgct cactacttcc ccttactcag aaaatattta 300
 aaatttataa tgttacatat atttaciaaat attaaagttt tttttgtgtg tgcgtcaagg 360
 aattgttgac aatttttagt 380

<210> 1596
<211> 127
<212> PRT
<213> Neisseria meningitidis

<400> 1596
Met Phe Val Asp Asn Gly Phe Asn Lys Thr Val Ala Ser Phe Ala Gln
1 5 10 15
Ile Val Glu Thr Phe Asp Val Phe Phe Phe Arg Asn Asn Cys Thr Phe
20 25 30
Phe Thr Gln Met Lys Gln Arg Cys Gly Trp Val Cys Ser Leu Val Tyr
35 40 45
Leu Val Asp Ile Phe Pro Arg Cys Gly Phe Glu Ile Pro Asn Arg Ser
50 55 60
Phe Lys Glu Leu Gly Leu Leu Ile Gln Ile Ser Leu Ser Glu Arg Phe
65 70 75 80
Arg Thr Asn Ala Glu Val Glu Ile Asp Ala His Tyr Phe Pro Leu Leu
85 90 95
Arg Lys Tyr Leu Lys Phe Ile Met Leu His Ile Phe Thr Asn Ile Lys
100 105 110
Val Phe Xaa Cys Val Cys Val Lys Glu Leu Leu Thr Ile Leu Val
115 120 125

<210> 1597
<211> 654
<212> DNA
<213> Neisseria gonorrhoeae

<400> 1597
atgttttccg taccgcgttc ctttttgccg ggcgttttcg tacttgccgc gcttgccgcc 60
tgcaaacctc aagacaacag tgcggcgcaa gccgcttctt caagtgcac cgcgccggct 120
gcggaaaatg cggcaaacgc gcaaacgcgc ggtacggata tgcgtaagga agacatcggc 180
ggcgatttca cactgaccga cggcgaaggc aagcctttca gcctgagcga tttgaaaggc 240
aaggtcgtga ttctgtcttt cggctttacg cactgtcccg atgtctgccc gacagggctt 300
ttgacgtaca gcgacacttt gaagcagttg ggcgggcagg ctaaggacgt gaaagtgggtg 360
ttcgtcagca tcgatccgga acgcgacacg cctgaaatca tcggcaagta tgccaaacag 420
ttcaatccgg actttatcgg tctgacggca acgggcggcc aaaacctgcc ggatcatcaag 480
cagcaatacc gcgtggtttc tgccaaaatc aatcaaaaag acgacagcga aaactatttg 540
gtcgaccact cttccggtgc gtatcttata gataaaaacg gtgaggttgc cattttctcg 600
ccttacggaa gcgagccgga aacgattgct gccgatgtaa ggaccctgct ctga 654

<210> 1598
<211> 217
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1598

Met Phe Ser Val Pro Arg Ser Phe Leu Pro Gly Val Phe Val Leu Ala
1 5 10 15

Ala Leu Ala Ala Cys Lys Pro Gln Asp Asn Ser Ala Ala Gln Ala Ala
20 25 30

Ser Ser Ser Ala Ser Ala Pro Ala Ala Glu Asn Ala Ala Lys Pro Gln
35 40 45

Thr Arg Gly Thr Asp Met Arg Lys Glu Asp Ile Gly Gly Asp Phe Thr
50 55 60

Leu Thr Asp Gly Glu Gly Lys Pro Phe Ser Leu Ser Asp Leu Lys Gly
65 70 75 80

Lys Val Val Ile Leu Ser Phe Gly Phe Thr His Cys Pro Asp Val Cys
85 90 95

Pro Thr Gly Leu Leu Thr Tyr Ser Asp Thr Leu Lys Gln Leu Gly Gly
100 105 110

Gln Ala Lys Asp Val Lys Val Val Phe Val Ser Ile Asp Pro Glu Arg
115 120 125

Asp Thr Pro Glu Ile Ile Gly Lys Tyr Ala Lys Gln Phe Asn Pro Asp
130 135 140

Phe Ile Gly Leu Thr Ala Thr Gly Gly Gln Asn Leu Pro Val Ile Lys
145 150 155 160

Gln Gln Tyr Arg Val Val Ser Ala Lys Ile Asn Gln Lys Asp Asp Ser
165 170 175

Glu Asn Tyr Leu Val Asp His Ser Ser Gly Ala Tyr Leu Ile Asp Lys
180 185 190

Asn Gly Glu Val Ala Ile Phe Ser Pro Tyr Gly Ser Glu Pro Glu Thr
195 200 205

Ile Ala Ala Asp Val Arg Thr Leu Leu
210 215

<210> 1599

<211> 654

<212> DNA

<213> Neisseria meningitidis

<400> 1599

atgttttccg taccgcgttc ctttttgccg ggcgttttcg tacttgccgc gcttgccgcc 60
tgcaaacctc aagacaacag tgcggcgcaa gtcgttctt caagtgcac cgcgtcggct 120
gcggaaaatg cggcaaagca anacacgcgc ggtacggata tgcgtaagga agacatcggc 180
ggcgatttca cgctgaccga cggcgaaggc aagcctttca acctgagcga ttgaaaggc 240
aaggtcgtga ttctgtcttt cggttttacg cactgtccc atgtctgcc gacagagctt 300
ttgacgtaca gcgacacgtt gaagcagttg ggcgggcagg ctaaggacgt gaaagtgggtg 360
ttcgtcagca tcgatccgga acgcgacacg cctgaaatca tcggcaagta tgccaaacag 420

ttcaatccgg actttatcgs tctgacggca acgggcggcc aaaacctgcc ggtcatcaag 480
 cagcaatacc gcgtgggttc tgccaaagtc aatcaaaamg acgacagcga aaactatttg 540
 gtcgaccact cttccggtgc gtatctcatc gacaaaaacg gtgaggttgc cattttctcg 600
 ccttacggaa gcgagccgga aacgattgct gccgatgtaa ggaccctgct ctga 654

<210> 1600

<211> 217

<212> PRT

<213> *Neisseria meningitidis*

<400> 1600

Met Phe Ser Val Pro Arg Ser Phe Leu Pro Gly Val Phe Val Leu Ala
 1 5 10 15

Ala Leu Ala Ala Cys Lys Pro Gln Asp Asn Ser Ala Ala Gln Val Ala
 20 25 30

Ser Ser Ser Ala Ser Ala Ser Ala Ala Glu Asn Ala Ala Lys Gln Xaa
 35 40 45

Thr Arg Gly Thr Asp Met Arg Lys Glu Asp Ile Gly Gly Asp Phe Thr
 50 55 60

Leu Thr Asp Gly Glu Gly Lys Pro Phe Asn Leu Ser Asp Leu Lys Gly
 65 70 75 80

Lys Val Val Ile Leu Ser Phe Gly Phe Thr His Cys Pro Asp Val Cys
 85 90 95

Pro Thr Glu Leu Leu Thr Tyr Ser Asp Thr Leu Lys Gln Leu Gly Gly
 100 105 110

Gln Ala Lys Asp Val Lys Val Val Phe Val Ser Ile Asp Pro Glu Arg
 115 120 125

Asp Thr Pro Glu Ile Ile Gly Lys Tyr Ala Lys Gln Phe Asn Pro Asp
 130 135 140

Phe Ile Xaa Leu Thr Ala Thr Gly Gly Gln Asn Leu Pro Val Ile Lys
 145 150 155 160

Gln Gln Tyr Arg Val Val Ser Ala Lys Val Asn Gln Xaa Asp Asp Ser
 165 170 175

Glu Asn Tyr Leu Val Asp His Ser Ser Gly Ala Tyr Leu Ile Asp Lys
 180 185 190

Asn Gly Glu Val Ala Ile Phe Ser Pro Tyr Gly Ser Glu Pro Glu Thr
 195 200 205

Ile Ala Ala Asp Val Arg Thr Leu Leu
 210 215

<210> 1601

<211> 654

<212> DNA

<213> *Neisseria meningitidis*

<400> 1601

```
atgtttttccg tacgcggttc ctttttgccg ggcgttttcg tacttgccgc gcttgccgcc 60
tgcaaacctc aagacaacag tgcggcgcaa gtcgcttctt caagtgcac cgcgtcggct 120
gcggaaaatg cggcaaagcc gcaaacgcgc ggtacggata tgcgtaagga agacatcggc 180
ggcgatttca cgctgaccga cggcgaaggc aagcctttca acctgagcga tttgaaaggc 240
aaggctcgtga ttctgtcttt cggctttacg cactgtcccg atgtctgccc gacagagctt 300
ttgacgtaca gcgacacgtt gaagcagttg ggcgggcagg ctaaggacgt gaaagtgggtg 360
ttcgtcagca tcgatccgga acgcgacacg cctgaaatca tcggcaagta tgccaaacag 420
ttcaatccgg actttatcgg tctgacggca acgggcgacc aaaacctgcc ggtcatcaag 480
cagcaatacc gcgtgggttc tgccaaagtc aatcaaaaag acgacagcga aaactatttg 540
gtcgaccact cttccgggtgc gtatctcatc gacaaaaacg gtgagggtgc cattttctcg 600
ccttacggaa gcgagccgga aacgattgct gccgatgtaa ggaccctgct ctga 654
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<210> 1602

<211> 217

<212> PRT

<213> *Neisseria meningitidis*

<400> 1602

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Met Phe Ser Val Pro Arg Ser Phe Leu Pro Gly Val Phe Val Leu Ala
  1             5             10             15

Ala Leu Ala Ala Cys Lys Pro Gln Asp Asn Ser Ala Ala Gln Val Ala
      20             25             30

Ser Ser Ser Ala Ser Ala Ser Ala Ala Glu Asn Ala Ala Lys Pro Gln
      35             40             45

Thr Arg Gly Thr Asp Met Arg Lys Glu Asp Ile Gly Gly Asp Phe Thr
      50             55             60

Leu Thr Asp Gly Glu Gly Lys Pro Phe Asn Leu Ser Asp Leu Lys Gly
      65             70             75             80

Lys Val Val Ile Leu Ser Phe Gly Phe Thr His Cys Pro Asp Val Cys
      85             90             95

Pro Thr Glu Leu Leu Thr Tyr Ser Asp Thr Leu Lys Gln Leu Gly Gly
      100            105            110

Gln Ala Lys Asp Val Lys Val Val Phe Val Ser Ile Asp Pro Glu Arg.
      115            120            125

Asp Thr Pro Glu Ile Ile Gly Lys Tyr Ala Lys Gln Phe Asn Pro Asp
      130            135            140

Phe Ile Gly Leu Thr Ala Thr Gly Asp Gln Asn Leu Pro Val Ile Lys
      145            150            155            160

Gln Gln Tyr Arg Val Val Ser Ala Lys Val Asn Gln Lys Asp Asp Ser
      165            170            175

Glu Asn Tyr Leu Val Asp His Ser Ser Gly Ala Tyr Leu Ile Asp Lys
```

180 185 190
 Asn Gly Glu Val Ala Ile Phe Ser Pro Tyr Gly Ser Glu Pro Glu Thr
 195 200 205

Ile Ala Ala Asp Val Arg Thr Leu Leu
 210 215

<210> 1603
 <211> 945
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1603
 atgataacgg acagggtttca tctcttttcat tttccagtat ctttcattta tcaatctgac 60
 aacaaaatgc cgctgaaaa cagttcagac ggcattttta ccacaaacgg cttacagctt 120
 ccattcgccc aacttggcag cgtaagcttc caaatctgca atcggacggg ttgccacgcc 180
 gctttccatc gctgcttttg cggcagccgt agcgcgcga ggcagcaggc gggaatcgaa 240
 cggagtagga atcaggtatt ccgcgccgaa ttcgaatttc ttaccgtaag cggcaaccac 300
 ttcttcggtt acttcttcca tcgccaaatc tgccaaagca tacacgcagg cgcgtttcat 360
 ttcttcggtg atggtggttg cgcgcacatc caacgcgccc cggaagatga acgggaagca 420
 caatacgttg ttcacttggt tcgggaagtc ggagcggccg gtaccgataa ccacgtccgg 480
 acgggtttct ttcgccagcg gcggcaggat ttccggattc gggttggcca tggcgaacac 540
 gatgggtttt tcgttcacgc tggtcaacat ttcaggcgtc agcaggtttg cgccggagag 600
 gcccaagaag atgtctttgc ctttaaccgc atcggcaagt acgcgcgggc cgttgtcttc 660
 aacggcgtag aatttttttg attcgtccat gcggtctttg tcttcgcggg tttggtaaat 720
 cagcctttg gagttgcaaa cggttacgtt ttcacgtttc aagcccaaat ccagcagttg 780
 gttcaggcag gcaatcgcg cggcacctgc gccggagcac accaaagtcg cttcttcgat 840
 tttacggccg gtataacgca gggcgttcaa tacggcggcg gcggtaatga tggccgtgcc 900
 gtgctggtca tcatgaaata cggggatttt gcagcgtttg cgtaa 945

<210> 1604
 <211> 314
 <212> PRT
 <213> *Neisseria gonorrhoeae*

<400> 1604
 Met Ile Thr Asp Arg Phe His Leu Phe His Phe Pro Val Ser Phe Ile
 1 5 10 15
 Tyr Gln Ser Asp Asn Lys Met Pro Pro Glu Asn Ser Ser Asp Gly Ile
 20 25 30
 Leu Thr Thr Asn Gly Leu Gln Leu Pro Phe Ala Gln Leu Gly Ser Val
 35 40 45
 Ser Phe Gln Ile Cys Asn Arg Thr Gly Cys His Ala Ala Phe His Arg
 50 55 60
 Cys Phe Gly Gly Ser Arg Ser Asp Ala Arg Gln Gln Ala Gly Ile Glu
 65 70 75 80
 Arg Ser Arg Asn Gln Val Phe Arg Ala Glu Phe Glu Phe Leu Thr Val
 85 90 95

Ser Gly Asn His Phe Phe Gly Tyr Phe Phe His Arg Gln Ile Cys Gln
 100 105 110
 Ser Ile His Ala Gly Ala Phe His Phe Phe Val Asp Gly Gly Cys Ala
 115 120 125
 Asp Ile Gln Arg Ala Pro Glu Asp Glu Arg Glu Ala Gln Tyr Val Val
 130 135 140
 His Leu Val Arg Glu Val Gly Ala Ala Gly Thr Asp Asn His Val Arg
 145 150 155 160
 Thr Gly Phe Phe Arg Gln Arg Arg Gln Asp Phe Arg Ile Arg Val Gly
 165 170 175
 His Gly Glu His Asp Gly Phe Phe Val His Arg Val Gln His Phe Arg
 180 185 190
 Arg Gln Gln Val Cys Ala Gly Glu Ala Gln Glu Asp Val Phe Ala Phe
 195 200 205
 Asn Arg Ile Gly Lys Tyr Ala Pro Ala Val Val Phe Asn Gly Val Glu
 210 215 220
 Phe Phe Gly Phe Val His Ala Val Phe Val Phe Ala Gly Leu Val Asn
 225 230 235 240
 His Ala Phe Gly Val Ala Asn Gly Tyr Val Phe Thr Phe Gln Ala Gln
 245 250 255
 Ile Gln Gln Leu Val Gln Ala Gly Asn Arg Gly Gly Thr Cys Ala Gly
 260 265 270
 Ala His Gln Ser Arg Phe Phe Asp Phe Thr Ala Gly Ile Thr Gln Gly
 275 280 285
 Val Gln Tyr Gly Gly Gly Gly Asn Asp Gly Arg Ala Val Leu Val Ile
 290 295 300
 Met Lys Tyr Gly Asp Phe Ala Ala Phe Ala
 305 310

<210> 1605

<211> 321

<212> DNA

<213> *Neisseria meningitidis*

<400> 1605

gacggcatcg gcaagcacgc gctggccggt gtcttcaatg gcgtagaact gtttggactc 60
 gtccatacgg tctttgtctt cgcggtttg gtaaatacag cctttggagt cgcaaacggt 120
 cacgttttgc cgtttcaagc ccaaatacag caattggwgc aagcaggcaa tcgcggccgc 180
 acctgcgcgc gaacacacca aagtcgcttc ttcgatttta cggccggtaa aacgcakggc 240
 gttcaatacgc gcggcggcgcg taatgatggc cgtgccgtgc tggtcgtcgt ggaatacggg 300
 gatattgcag cgtttgcgta a 321

<210> 1606
<211> 106
<212> PRT
<213> *Neisseria meningitidis*

<400> 1606
Asp Gly Ile Gly Lys His Ala Leu Ala Val Val Phe Asn Gly Val Glu
1 5 10 15
Leu Phe Gly Leu Val His Thr Val Phe Val Phe Ala Gly Leu Val Asn
20 25 30
His Ala Phe Gly Val Ala Asn Gly His Val Phe Ala Phe Gln Ala Gln
35 40 45
Ile Gln Gln Leu Xaa Gln Ala Gly Asn Arg Gly Arg Thr Cys Ala Gly
50 55 60
Thr His Gln Ser Arg Phe Phe Asp Phe Thr Ala Gly Lys Thr Xaa Gly
65 70 75 80
Val Gln Tyr Gly Gly Gly Gly Asn Asp Gly Arg Ala Val Leu Val Val
85 90 95
Val Glu Tyr Gly Asp Phe Ala Ala Phe Ala
100 105

<210> 1607
<211> 900
<212> DNA
<213> *Neisseria meningitidis*

<400> 1607
ctatatcaat ctgacagcaa aatgccgcct gaaaacagtt cagacggcat ttaaccgca 60
aacggcttac agcttccatt cgctcagctt ggcagcgtaa gcttccaaat ctgcaatcgg 120
acgggttgcc acgccgttt ccacgctgc tttggcgga gccgtagcaa cgcgcggcag 180
caggcgggaa tcgaacggag tcggaatcag gtattccgcg ccgaattcaa atttcttacc 240
gtaagcggca accacttctt cggttacctc ttccatcgcc aaatccgcca aagcatacac 300
gcaggcgcgt ttcatttctt cgttgatggt cgtcgcgcg acatccaacg caccgcggaa 360
gatgaacggg aagcacaata cattgttcac ttggttcggg aagtcggagc ggccggtacc 420
gataaccacg tccggacggg tttctttcgc cagcggcggc aggatttcg gattcgggtt 480
ggccatagcg aacacgatgg gtttttcggt catggtgttc agtatttcag gcgtcagcag 540
gttcgcgcgc gagaggccca agaagatgtc tttgccttg acggcatcgg caagcacgcg 600
ctggccgttg tcttcaatgg cgtagaactg tttggactcg tccatacggc ctttgtcttc 660
gcgggtttgg taaatcacgc ctttgagtc gcaaacggtc acgttttcgc gtttcaagcc 720
caaatccagc aattggttca agcaggcaat cgcggcgca cctgcgcgcg aacacaccaa 780
agtcgcttct tcgattttac ggccggtaaa acgcagggcg ttcaatacgg cagcggcggt 840
aatgatggcc gtgcggtgct ggtcgtcgtg gaatacgggg attttgcagc gtttgcgtaa 900

<210> 1608
<211> 299
<212> PRT
<213> *Neisseria meningitidis*

<400> 1608

Leu Tyr Gln Ser Asp Ser Lys Met Pro Pro Glu Asn Ser Ser Asp Gly
1 5 10 15

Ile Leu Thr Ala Asn Gly Leu Gln Leu Pro Phe Ala Gln Leu Gly Ser
20 25 30

Val Ser Phe Gln Ile Cys Asn Arg Thr Gly Cys His Ala Ala Phe His
35 40 45

Arg Cys Phe Gly Gly Ser Arg Ser Asn Ala Arg Gln Gln Ala Gly Ile
50 55 60

Glu Arg Ser Arg Asn Gln Val Phe Arg Ala Glu Phe Lys Phe Leu Thr
65 70 75 80

Val Ser Gly Asn His Phe Phe Gly Tyr Leu Phe His Arg Gln Ile Arg
85 90 95

Gln Ser Ile His Ala Gly Ala Phe His Phe Phe Val Asp Gly Arg Arg
100 105 110

Ala Asp Ile Gln Arg Thr Ala Glu Asp Glu Arg Glu Ala Gln Tyr Ile
115 120 125

Val His Leu Val Arg Glu Val Gly Ala Ala Gly Thr Asp Asn His Val
130 135 140

Arg Thr Gly Phe Phe Arg Gln Arg Arg Gln Asp Phe Arg Ile Arg Val
145 150 155 160

Gly His Ser Glu His Asp Gly Phe Phe Val His Gly Val Gln Tyr Phe
165 170 175

Arg Arg Gln Gln Val Arg Ala Gly Glu Ala Gln Glu Asp Val Phe Ala
180 185 190

Phe Asp Gly Ile Gly Lys His Ala Leu Ala Val Val Phe Asn Gly Val
195 200 205

Glu Leu Phe Gly Leu Val His Thr Val Phe Val Phe Ala Gly Leu Val
210 215 220

Asn His Ala Phe Gly Val Ala Asn Gly His Val Phe Ala Phe Gln Ala
225 230 235 240

Gln Ile Gln Gln Leu Val Gln Ala Gly Asn Arg Gly Arg Thr Cys Ala
245 250 255

Gly Thr His Gln Ser Arg Phe Phe Asp Phe Thr Ala Gly Lys Thr Gln
260 265 270

Gly Val Gln Tyr Gly Ser Gly Gly Asn Asp Gly Arg Ala Val Leu Val
275 280 285

Val Val Glu Tyr Gly Asp Phe Ala Ala Phe Ala
290 295

<210> 1609
<211> 534
<212> DNA
<213> Neisseria gonorrhoeae

<400> 1609
atgaagctga aaaccttggt attgcccttc gccgcactgg cattgtgtgc caacgcattt 60
gccgccccgc ccggcgacgc gtcgttggca cgttggctgg atacgcagaa ttcgaccgg 120
gatatagaaa aaaatatgat tgaaggcttt aatgccggat ttaaaccgta tgcggacaaa 180
gcccttgccg aaatgccgga agcgaaaaaa gatcaggcgg cagaagcctt taatcgttat 240
cgtgagaatg ttttgaaaga tttgattacg cccgaagtga aacaggctgt ccgcaatacc 300
ttattgaaga atgcccgtga aatatacacg caagaagaaa ttgacggcat gattgccttt 360
tacggttcgc ctgtcgggtca gtccgtcgtt gccaaaaatc cgcgcttaac caagaaatcg 420
atgagtgaag tagcgggtatc ttggactgca ttgtcaggga aaatcgcgcg acatcatctg 480
cccagattta cggaagagtt acggcgcatc atctgcggcg gtatagtga ttaa 534

<210> 1610
<211> 177
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1610
Met Lys Leu Lys Thr Leu Leu Leu Pro Phe Ala Ala Leu Ala Leu Cys
1 5 10 15
Ala Asn Ala Phe Ala Ala Pro Pro Gly Asp Ala Ser Leu Ala Arg Trp
20 25 30
Leu Asp Thr Gln Asn Phe Asp Arg Asp Ile Glu Lys Asn Met Ile Glu
35 40 45
Gly Phe Asn Ala Gly Phe Lys Pro Tyr Ala Asp Lys Ala Leu Ala Glu
50 55 60
Met Pro Glu Ala Lys Lys Asp Gln Ala Ala Glu Ala Phe Asn Arg Tyr
65 70 75 80
Arg Glu Asn Val Leu Lys Asp Leu Ile Thr Pro Glu Val Lys Gln Ala
85 90 95
Val Arg Asn Thr Leu Leu Lys Asn Ala Arg Glu Ile Tyr Thr Gln Glu
100 105 110
Glu Ile Asp Gly Met Ile Ala Phe Tyr Gly Ser Pro Val Gly Gln Ser
115 120 125
Val Val Ala Lys Asn Pro Arg Leu Ile Lys Lys Ser Met Ser Glu Ile
130 135 140
Ala Val Ser Trp Thr Ala Leu Ser Gly Lys Ile Ala Arg His His Leu
145 150 155 160
Pro Glu Phe Thr Glu Glu Leu Arg Arg Ile Ile Cys Gly Gly Ile Val
165 170 175

Asp

<210> 1611
<211> 582
<212> DNA
<213> *Neisseria meningitidis*

<400> 1611
attaaactga aaaccttggt attgcccttc gccacgctgg cattgtgcac caatgctttt 60
gccgccccgc ccagcgacgc gtcgttggcg cgttggctgg atacgcagaa ttttgaccgg 120
gatatagaaa aaaatatgat tgagggtttt aatgccggat ttaaaccgta tgcggacaaa 180
gcccttgccg aaatgccgga agcgaaaaaa gatcaggcgg cagaagcctt taaccgttat 240
cgtgagaatg ttttgaaaga ttgattacg cccgaagtga aacaggctgt ccgcaatact 300
ttattgaaga atgcccgtga gatatacacg caagaagaaa ttgacggcat gattgccttt 360
tacggttcgc ctgtcggta gtccgtcgtt gccaaaaatc cgcgcttaat caagaaatcg 420
atgagtgaag tagcgggtatc ttggactgca ttgtcaggga aaatcgcgca acatcatctg 480
cccgagttta cgggaagatt gcggcgcatc atctgcggcg gtaaaaatcc cgatgcgggc 540
tgtaacaag ccggacaggt tgggaaaagg catcagaaat aa 582

<210> 1612
<211> 193
<212> PRT
<213> *Neisseria meningitidis*

<400> 1612
Ile Lys Leu Lys Thr Leu Leu Leu Pro Phe Ala Thr Leu Ala Leu Cys
1 5 10 15
Thr Asn Ala Phe Ala Ala Pro Pro Ser Asp Ala Ser Leu Ala Arg Trp
20 25 30
Leu Asp Thr Gln Asn Phe Asp Arg Asp Ile Glu Lys Asn Met Ile Glu
35 40 45
Gly Phe Asn Ala Gly Phe Lys Pro Tyr Ala Asp Lys Ala Leu Ala Glu
50 55 60
Met Pro Glu Ala Lys Lys Asp Gln Ala Ala Glu Ala Phe Asn Arg Tyr
65 70 75 80
Arg Glu Asn Val Leu Lys Asp Leu Ile Thr Pro Glu Val Lys Gln Ala
85 90 95
Val Arg Asn Thr Leu Leu Lys Asn Ala Arg Glu Ile Tyr Thr Gln Glu
100 105 110
Glu Ile Asp Gly Met Ile Ala Phe Tyr Gly Ser Pro Val Gly Gln Ser
115 120 125
Val Val Ala Lys Asn Pro Arg Leu Ile Lys Lys Ser Met Ser Glu Ile
130 135 140

Ala Val Ser Trp Thr Ala Leu Ser Gly Lys Ile Ala Gln His His Leu
145 150 155 160

Pro Glu Phe Thr Glu Glu Leu Arg Arg Ile Ile Cys Gly Gly Lys Asn
165 170 175

Pro Asp Ala Gly Cys Lys Gln Ala Gly Gln Val Gly Lys Arg His Gln
180 185 190

Lys

<210> 1613

<211> 582

<212> DNA

<213> Neisseria meningitidis

<400> 1613

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attaaactga aaaccttggt attgcccttc gccacgctgg cattgtgcac caatgctttt 60
gccgccccgc ccagcgacgc gtcgttggcg cgttggtgctgg atacgcagaa ttttgaccgg 120
gatatagaaa aaaatatgat tgagggcttt aatgccggat ttaaaccgta tgcggacaaa 180
gcccttgccg aaatgccgga agcgaaaaaa gatcaggcgg cagaagcctt taaccgttat 240
cgtgagaatg ttttgaaaga tttgattacg cccgaagtga aacaggctgt ccgcaatact 300
ttattgaaga atgcccgatg gatatacacg caagaagaaa ttgacggcat gattgccttt 360
tacggttcgc ctgtcgggtca gtccgtcggt gccaaaaatc cgcgcttaat caagaaatcg 420
atgagtgaag tagcgggtatc ttggactgca ttgtcaggga aaatcgcgca acatcatctg 480
cccagattta cggaagaggt gcggcgcatc atctgcggcg gtaaaaatcc cgatgcgggc 540
tgtaaacaag ccggacagggt tgggaaaagg catcagaaat aa 582
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<210> 1614

<211> 193

<212> PRT

<213> Neisseria meningitidis

<400> 1614

Ile Lys Leu Lys Thr Leu Leu Leu Pro Phe Ala Thr Leu Ala Leu Cys
1 5 10 15

Thr Asn Ala Phe Ala Ala Pro Pro Ser Asp Ala Ser Leu Ala Arg Trp
20 25 30

Leu Asp Thr Gln Asn Phe Asp Arg Asp Ile Glu Lys Asn Met Ile Glu
35 40 45

Gly Phe Asn Ala Gly Phe Lys Pro Tyr Ala Asp Lys Ala Leu Ala Glu
50 55 60

Met Pro Glu Ala Lys Lys Asp Gln Ala Ala Glu Ala Phe Asn Arg Tyr
65 70 75 80

Arg Glu Asn Val Leu Lys Asp Leu Ile Thr Pro Glu Val Lys Gln Ala
85 90 95

Val Arg Asn Thr Leu Leu Lys Asn Ala Arg Glu Ile Tyr Thr Gln Glu
100 105 110

Glu Ile Asp Gly Met Ile Ala Phe Tyr Gly Ser Pro Val Gly Gln Ser
115 120 125

Val Val Ala Lys Asn Pro Arg Leu Ile Lys Lys Ser Met Ser Glu Ile
130 135 140

Ala Val Ser Trp Thr Ala Leu Ser Gly Lys Ile Ala Gln His His Leu
145 150 155 160

Pro Glu Phe Thr Glu Glu Leu Arg Arg Ile Ile Cys Gly Gly Lys Asn
165 170 175

Pro Asp Ala Gly Cys Lys Gln Ala Gly Gln Val Gly Lys Arg His Gln
180 185 190

Lys

<210> 1615

<211> 588

<212> DNA

<213> Neisseria meningitidis

<400> 1615

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ttgaatatta aactgaaaac cttgttattg cccttcgcca cgctggcatt gtgcaccaat 60
gcttttgccg ccccgcccag cgacgcgtcg ttggcgcggt ggctggatac gcagaatttt 120
gaccgggata tagaaaaaaa tatgattgag ggctttaatg ccggatttaa accgtatgcg 180
gacaaagccc ttgccgaaat gccggaagcg aaaaaagatc aggcggcaga agcctttaac 240
cgttatcggtg agaatgtttt gaaagatttg attacgcccg aagtgaatac ggctgtccgc 300
aatactttat tgaagaatgc ccgtgagata tacacgcaag aagaaattga cggcatgatt 360
gccttttacg gttgcgctgt cggtcagtcg gtcggttgcca aaaatccgcg cttaatcaag 420
aaatcgatga gtgaaatagc ggtatcttgg actgcattgt cagggaatac cgcgcaacat 480
catctgcccg agtttacgga agagttgcgg cgcacatctt gcggcggtta aaatcccgat 540
gcgggctgta aacaagccgg acaggttggg aaaaggcatc agaaataa 588
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<210> 1616

<211> 195

<212> PRT

<213> Neisseria meningitidis

<400> 1616

Leu Asn Ile Lys Leu Lys Thr Leu Leu Leu Pro Phe Ala Thr Leu Ala
1 5 10 15

Leu Cys Thr Asn Ala Phe Ala Ala Pro Pro Ser Asp Ala Ser Leu Ala
20 25 30

Arg Trp Leu Asp Thr Gln Asn Phe Asp Arg Asp Ile Glu Lys Asn Met
35 40 45

Ile Glu Gly Phe Asn Ala Gly Phe Lys Pro Tyr Ala Asp Lys Ala Leu
50 55 60

Ala Glu Met Pro Glu Ala Lys Lys Asp Gln Ala Ala Glu Ala Phe Asn

Arg Trp Leu Asp Thr Gln Asn Phe Asp Arg Asp Ile Glu Lys Asn Met
 35 40 45
 Ile Glu Gly Phe Asn Ala Gly Phe Lys Pro Tyr Ala Asp Lys Ala Leu
 50 55 60
 Ala Glu Met Pro Glu Ala Lys Lys Asp Gln Ala Ala Glu Ala Phe Asn
 65 70 75 80
 Arg Tyr Arg Glu Asn Val Leu Lys Asp Leu Ile Thr Pro Glu Val Lys
 85 90 95
 Gln Ala Val Arg Asn Thr Leu Leu Lys Asn Ala Arg Glu Ile Tyr Thr
 100 105 110
 Gln Glu Glu Ile Asp Gly Met Ile Ala Phe Tyr Gly Ser Pro Val Gly
 115 120 125
 Gln Ser Val Val Ala Lys Asn Pro Arg Leu Ile Lys Lys Ser Met Ser
 130 135 140
 Glu Ile Ala Val Ser Trp Thr Ala Leu Ser Gly Lys Ile Ala Gln His
 145 150 155 160
 His Leu Pro Glu Phe Thr Glu Glu Leu Arg Arg Ile Ile Cys Gly Gly
 165 170 175
 Lys Asn Pro Asp Ala Gly Cys Lys Gln Ala Gly Gln Val Gly Lys Arg
 180 185 190
 His Gln Lys
 195

<210> 1619
 <211> 792
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1619
 atggattatc tgcaaaacct gtctttgggc ttgacaaaaa agctgcccgt tatactgcaa 60
 acagaagtag cggagtgtgg cttggcatgt ctagcggctg tggcgggatt ttatggtttc 120
 tatacggatt tgcgcgcact gcgttcaaaa tactgtctgt cacttaaggg tgagaatttg 180
 gcagatattg ttcgttttgc tgatgatatg gggctgacgg gacgggcggt gaggctggat 240
 ttagacgaat tgggcagttt gcgcctgccc tgtattctac attgggattt gaatcatttt 300
 gtggtgctgg aatcggatc ttcggacggg gctgccgtca tggatccggc ttcgggacga 360
 cgcaaaagtca agacggagga aatatcgcg cagtttacgg gaattgcttt ggaactgttg 420
 ccaaacacgc gtttcgaggc aggggaagaa aagcaggaaa tccgcaccc acccatgttg 480
 cgcgggattt ctgggctggg gcggacattg tttcagcttt tggctttggc agcagcaatg 540
 gaagtgtttg cttttttaca aaacgtcagc ttcaagatcg gacgtggtga atcgcttgcg 600
 ttaatcggac gatcgggctg cggtaaatcg acacttttgg atattttaag cggcaatcta 660
 cctcccgaat caggcaaagt catgataaat gggcacgaca ttacagctt accgccacct 720
 tttattccgc aatttgagtg cgatggtcaa ggcaggacga tgttttatag tggattaaat 780
 ttaaaccggg ag 792

<210> 1621
<211> 554
<212> DNA
<213> Neisseria meningitidis

<400> 1621
atggattatt tatcaagact gtccttttga tttacaaaa agctacctgt cattctgcaa 60
acagaagttg ctgaatgtgg tttagcatgc ctgacatcca tcttgtocta ttatggcttt 120
cacactgatt taagaacgtt acgccaaaaa tacaccctgt cattaaaggg cgcaaattctt 180
gcagacatca tgagatttgg caatgaaatg aatttaacgc cagcagcttt gcgttttagag 240
ttagatgagc tgtcaaattt acaactaccc tgcattctcc attggaactt aaaccatttt 300
gttgtacttt gttccatttc caaagacagt atcgtcatta tggaccctgc tgtcggtagt 360
cgaaaaatca aaatggacga agtttcacaa aaattcacag ggattgccct agaattattc 420
cccaataccc attttgaaga gaaaaaagaa acaaagaaaa tcaaaatatt atctctatta 480
aggggggggc aggottaaaa cgctctttaa ttcaaatgct tatattagct atttctttgg 540
aagtctttgc attg 554

<210> 1622
<211> 185
<212> PRT
<213> Neisseria meningitidis

<400> 1622
Met Asp Tyr Leu Ser Arg Leu Ser Phe Gly Phe Asn Lys Lys Leu Pro
1 5 10 15
Val Ile Leu Gln Thr Glu Val Ala Glu Cys Gly Leu Ala Cys Leu Thr
20 25 30
Ser Ile Leu Ser Tyr Tyr Gly Phe His Thr Asp Leu Arg Thr Leu Arg
35 40 45
Gln Lys Tyr Thr Leu Ser Leu Lys Gly Ala Asn Leu Ala Asp Ile Met
50 55 60
Arg Phe Gly Asn Glu Met Asn Leu Thr Pro Arg Ala Leu Arg Leu Glu
65 70 75 80
Leu Asp Glu Leu Ser Asn Leu Gln Leu Pro Cys Ile Leu His Trp Asn
85 90 95
Leu Asn His Phe Val Val Leu Cys Ser Ile Ser Lys Asp Ser Ile Val
100 105 110
Ile Met Asp Pro Ala Val Gly Met Arg Lys Ile Lys Met Asp Glu Val
115 120 125
Ser Gln Lys Phe Thr Gly Ile Ala Leu Glu Leu Phe Pro Asn Thr His
130 135 140
Phe Glu Glu Lys Lys Glu Thr Lys Lys Ile Lys Ile Leu Ser Leu Leu
145 150 155 160
Arg Gly Xaa Ser Gly Leu Lys Arg Ser Leu Ile Gln Met Leu Ile Leu
165 170 175

Ala Ile Ser Leu Glu Val Phe Ala Leu
180 185

<210> 1623
<211> 153
<212> DNA
<213> Neisseria meningitidis

<400> 1623
atgccccatc tgcaaaacct gtctttgggc ttaaagaaaa agctgcctgt tatcctgcaa 60
acagaaatat cagaatgcgg cttggcatgt ctggcggctg tggcgggatt tcatggtttc 120
catacgaatt tacgcgcact gcgttcaaaa tac 153

<210> 1624
<211> 51
<212> PRT
<213> Neisseria meningitidis

<400> 1624
Met Pro His Leu Gln Asn Leu Ser Leu Gly Leu Lys Lys Lys Leu Pro
1 5 10 15

Val Ile Leu Gln Thr Glu Ile Ser Glu Cys Gly Leu Ala Cys Leu Ala
20 25 30

Ala Val Ala Gly Phe His Gly Phe His Thr Asn Leu Arg Ala Leu Arg
35 40 45

Ser Lys Tyr
50

<210> 1625
<211> 1170
<212> DNA
<213> Neisseria meningitidis

<400> 1625
atgacagcac ataaaaatcct gcccgtoctt cttcccatca tcttaggcgt ttctcagca 60
acggctgcat cgccgcgcc caacagaccg acggtacacg ccgccccac gctccaaaca 120
cccgaacccc tcacggcggc acacatcggt atcgaccttc aaagcaggca gactttatcc 180
gccaaaaaca ccaatacccc tgtcgaaccg gcggcactaa cccaactgat gaccgcatat 240
ttggttttca aaaacatgaa atcgggaaat atccaatctg aagaaaactt aaaaataccc 300
gaatccgcat gggcttcaga aggaagcaga atgtttgtac gtcccggcga tacggtcagc 360
accgacaaac tcttaaaagg catgattgcc ctatgcgcaa acgatgccgc cctaaccctt 420
gccgaccggc tgggcaacgg ctcgattgaa aattttgtgc aacaaatgaa caaagaagcc 480
cgacgcttgg gcatgaagaa caccgtattc aaaaaccga caggcttggg tagagaagga 540
caggtttcca ccgcaaaga cctctccctg ctgtctgaag cattgatgcg cgactttccg 600
gaatattacc cgctgttttc catcaaatcg ttcaagtttg aaaacataga acaaaacaac 660
cgcaatatcc ttttatatag ggacaacaat gtaaaccggc tgaaagccgg gcacacagaa 720
agcggcggct acaaccttgc cgtgtcatat tccggcaacg gcaggcacat ccttgtcatc 780
acactagggt cggaatcggc gaaaccgc gcacggaca acagcaagct gctgaaccgg 840
gcattgcagg ctttcgatac gccaaaata tatccgaaag gcaaaaccgt tgcccaaatc 900
caaatttccg gaggcagcaa aaaaaccgtc cgcgcaggct tcctcaaaga agcctacatc 960

actctgccac ataaagaaoc gaaaatggca gaacagattt tggaaaccat acagccgatt 1020
 cccgccccgg taaaaaaagg gcagatttta ggaaaaatca aaatcaggca aaacggacat 1080
 accattgccg aaaaagaaat cgtcgcactg gaaaacgtag aaaaaagaag ccggtggcaa 1140
 aggctttgga cgcgtctgac agggcagtaa 1170

<210> 1626
 <211> 389
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1626
 Met Thr Ala His Lys Ile Leu Pro Val Leu Leu Pro Ile Ile Leu Gly
 1 5 10 15
 Val Ser His Ala Thr Ala Ala Ser Pro Ala Pro Asn Arg Pro Thr Val
 20 25 30
 His Ala Ala Pro Thr Leu Gln Thr Pro Glu Thr Leu Thr Ala Ala His
 35 40 45
 Ile Val Ile Asp Leu Gln Ser Arg Gln Thr Leu Ser Ala Lys Asn Thr
 50 55 60
 Asn Thr Pro Val Glu Pro Ala Ala Leu Thr Gln Leu Met Thr Ala Tyr
 65 70 75 80
 Leu Val Phe Lys Asn Met Lys Ser Gly Asn Ile Gln Ser Glu Glu Asn
 85 90 95
 Leu Lys Ile Pro Glu Ser Ala Trp Ala Ser Glu Gly Ser Arg Met Phe
 100 105 110
 Val Arg Pro Gly Asp Thr Val Ser Thr Asp Lys Leu Leu Lys Gly Met
 115 120 125
 Ile Ala Leu Cys Ala Asn Asp Ala Ala Leu Thr Leu Ala Asp Arg Leu
 130 135 140
 Gly Asn Gly Ser Ile Glu Asn Phe Val Gln Gln Met Asn Lys Glu Ala
 145 150 155 160
 Arg Arg Leu Gly Met Lys Asn Thr Val Phe Lys Asn Pro Thr Gly Leu
 165 170 175
 Gly Arg Glu Gly Gln Val Ser Thr Ala Lys Asp Leu Ser Leu Leu Ser
 180 185 190
 Glu Ala Leu Met Arg Asp Phe Pro Glu Tyr Tyr Pro Leu Phe Ser Ile
 195 200 205
 Lys Ser Phe Lys Phe Glu Asn Ile Glu Gln Asn Asn Arg Asn Ile Leu
 210 215 220
 Leu Tyr Arg Asp Asn Asn Val Asn Gly Leu Lys Ala Gly His Thr Glu
 225 230 235 240

Ser Gly Gly Tyr Asn Leu Ala Val Ser Tyr Ser Gly Asn Gly Arg His
245 250 255

Ile Leu Val Ile Thr Leu Gly Ser Glu Ser Ala Glu Thr Arg Ala Ser
260 265 270

Asp Asn Ser Lys Leu Leu Asn Arg Ala Leu Gln Ala Phe Asp Thr Pro
275 280 285

Lys Ile Tyr Pro Lys Gly Lys Thr Val Ala Gln Ile Gln Ile Ser Gly
290 295 300

Gly Ser Lys Lys Thr Val Arg Ala Gly Phe Leu Lys Glu Ala Tyr Ile
305 310 315 320

Thr Leu Pro His Lys Glu Ala Lys Met Ala Glu Gln Ile Leu Glu Thr
325 330 335

Ile Gln Pro Ile Pro Ala Pro Val Lys Lys Gly Gln Ile Leu Gly Lys
340 345 350

Ile Lys Ile Arg Gln Asn Gly His Thr Ile Ala Glu Lys Glu Ile Val
355 360 365

Ala Leu Glu Asn Val Glu Lys Arg Ser Arg Trp Gln Arg Leu Trp Thr
370 375 380

Arg Leu Thr Gly Gln
385

<210> 1627

<211> 1170

<212> DNA

<213> Neisseria meningitidis

<400> 1627

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cccgaaaccc tcacagcggc acacatcggt atcgaccttc aaagcaaaca gattttatcc 180
gccaaaaaca tcaatacccc tgttgaaccg gcggcactaa cccaactgat gaccgcatat 240
ctgggttttca aaaacatgaa atcgggcaat atccaatctg aagaaaactt aaaaataccc 300
gaatccgcat gggcttcaga aggaagcaga atgtttgtac gtcccgcgca tacggtcagc 360
accgacaaac tcttaaaagg catgattgca ctatccgcaa acgatgccgc cctaaccctt 420
gccggccggc tgggcaacgg ctcgattgaa aattttgtgc aacaaatgaa caaagaagcc 480
cgacgcttgg gcatgaagaa cactgtattc aaaaacccga caggcttgag tagagaagga 540
cagggtttcca ccgcaaaga cctcgccctg ctgtctgaag cattgatgag cgactttccg 600
gaatattacc cgctgttttc catcaaatct ttcaaattca aaaaatataa acaaaacaac 660
cgcaatatcc ttttatatag ggacaacaat gtaaaccgtc tgaaagccgg acacacagaa 720
agcggcggct acaaccttgc cgtgtcatac tccggcaacg gcaggcacat ccttgtcatc 780
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gcaattgcagg ccttcgatac gcccaaaata tatccgaaag gcaaaaccgt tgcccaaatc 900
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cccgccccag taaaaaaagg gcaaatttta ggaaaaatca aaatcagaca aaacggatc 1080
accattgccg aaaaagaaat cgtcgcactg gaaaatgtaa aaaaaagaag ccggtggcaa 1140

aggcctttggg cgtgtctgac agggcagtaa

1170

<210> 1628

<211> 389

<212> PRT

<213> Neisseria meningitidis

<400> 1628

Met Thr Ala His Lys Ile Leu Pro Val Leu Leu Ser Ile Ile Leu Gly
1 5 10 15

Val Ser His Ala Thr Ala Ala Ser Pro Ala Pro Asn Arg Pro Thr Val
20 25 30

His Ala Ala Pro Thr Phe Gln Thr Pro Glu Thr Leu Thr Ala Ala His
35 40 45

Ile Val Ile Asp Leu Gln Ser Lys Gln Ile Leu Ser Ala Lys Asn Ile
50 55 60

Asn Thr Pro Val Glu Pro Ala Ala Leu Thr Gln Leu Met Thr Ala Tyr
65 70 75 80

Leu Val Phe Lys Asn Met Lys Ser Gly Asn Ile Gln Ser Glu Glu Asn
85 90 95

Leu Lys Ile Pro Glu Ser Ala Trp Ala Ser Glu Gly Ser Arg Met Phe
100 105 110

Val Arg Pro Gly Asp Thr Val Ser Thr Asp Lys Leu Leu Lys Gly Met
115 120 125

Ile Ala Leu Ser Ala Asn Asp Ala Ala Leu Thr Leu Ala Gly Arg Leu
130 135 140

Gly Asn Gly Ser Ile Glu Asn Phe Val Gln Gln Met Asn Lys Glu Ala
145 150 155 160

Arg Arg Leu Gly Met Lys Asn Thr Val Phe Lys Asn Pro Thr Gly Leu
165 170 175

Ser Arg Glu Gly Gln Val Ser Thr Ala Lys Asp Leu Ala Leu Leu Ser
180 185 190

Glu Ala Leu Met Arg Asp Phe Pro Glu Tyr Tyr Pro Leu Phe Ser Ile
195 200 205

Lys Ser Phe Lys Phe Lys Asn Ile Glu Gln Asn Asn Arg Asn Ile Leu
210 215 220

Leu Tyr Arg Asp Asn Asn Val Asn Gly Leu Lys Ala Gly His Thr Glu
225 230 235 240

Ser Gly Gly Tyr Asn Leu Ala Val Ser Tyr Ser Gly Asn Gly Arg His
245 250 255

Ile Leu Val Ile Thr Leu Gly Ser Glu Ser Ala Glu Thr Arg Ala Ser
260 265 270

Asp Asn Ser Lys Leu Leu Asn Trp Ala Leu Gln Ala Phe Asp Thr Pro
275 280 285

Lys Ile Tyr Pro Lys Gly Lys Thr Val Ala Gln Ile Gln Ile Ser Gly
290 295 300

Gly Ser Lys Lys Thr Val Arg Ala Gly Phe Leu Lys Glu Ala Tyr Ile
305 310 315 320

Thr Leu Pro His Lys Glu Ala Lys Met Ala Glu Gln Ile Leu Glu Thr
325 330 335

Ile Gln Pro Ile Pro Ala Pro Val Lys Lys Gly Gln Ile Leu Gly Lys
340 345 350

Ile Lys Ile Arg Gln Asn Gly Tyr Thr Ile Ala Glu Lys Glu Ile Val
355 360 365

Ala Leu Glu Asn Val Lys Lys Arg Ser Arg Trp Gln Arg Leu Trp Ala
370 375 380

Cys Leu Thr Gly Gln
385

<210> 1629

<211> 1170

<212> DNA

<213> *Neisseria meningitidis*

<400> 1629

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cccgaacccc tcacagcggc acacatcggt atcgaccttc aaagcaaaca gattttatcc 180
gccaaaaaca tcaatacccc tgtcgaaccg gcggcactaa cccaactgat gaccgcatat 240
ctggttttca aaaacatgaa atcgggaaat atccgatctg aagaaaactt aaaaataccc 300
gaatccgcat gggcttcaga aggaagcaga atgtttgtac gtcccggcga tacggtcagc 360
accgacaaac tcttaaaagg catgattgca ctatccgcaa acgatgccgc cctaaccctt 420
gccggccggc tgggcaacgg ctcgattgaa aattttgtgc aacaaatgaa caaagaagcc 480
cgacgcttgg gcatgaagaa cactgtattc aaaaatccga caggcttgag tagagaagga 540
caggtttcca ccgccaaaga cctcgcccag ctgtctgaag cattgatgcg cgactttccg 600
gaatattacc cgctgttttc catcaaactt ttcaaattca aaaatataga gcaaaacaac 660
cgcaatatcc ttttatatag ggacaacaat gtaaaccggtc tgaaagccgg acacacagaa 720
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cccgccccag taaaaaaagg gcaaatttta ggaaaaatca aaatcagaca aaacggatac 1080
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aggcttggg cgtgtctgac agggcagtaa 1170

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<210> 1630
<211> 389
<212> PRT
<213> Neisseria meningitidis

<400> 1630

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Thr | Ala | His | Lys | Ile | Leu | Pro | Val | Leu | Leu | Ser | Ile | Ile | Leu | Gly |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Val | Ser | His | Ala | Thr | Ala | Ala | Ser | Pro | Ala | Pro | Asn | Arg | Pro | Thr | Ala |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| His | Ala | Ala | Pro | Thr | Phe | Gln | Thr | Pro | Glu | Thr | Leu | Thr | Ala | Ala | His |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Ile | Val | Ile | Asp | Leu | Gln | Ser | Lys | Gln | Ile | Leu | Ser | Ala | Lys | Asn | Ile |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Asn | Thr | Pro | Val | Glu | Pro | Ala | Ala | Leu | Thr | Gln | Leu | Met | Thr | Ala | Tyr |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Leu | Val | Phe | Lys | Asn | Met | Lys | Ser | Gly | Asn | Ile | Arg | Ser | Glu | Glu | Asn |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Leu | Lys | Ile | Pro | Glu | Ser | Ala | Trp | Ala | Ser | Glu | Gly | Ser | Arg | Met | Phe |
| | | | 100 | | | | | 105 | | | | | | 110 | |
| Val | Arg | Pro | Gly | Asp | Thr | Val | Ser | Thr | Asp | Lys | Leu | Leu | Lys | Gly | Met |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ile | Ala | Leu | Ser | Ala | Asn | Asp | Ala | Ala | Leu | Thr | Leu | Ala | Gly | Arg | Leu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Gly | Asn | Gly | Ser | Ile | Glu | Asn | Phe | Val | Gln | Gln | Met | Asn | Lys | Glu | Ala |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Arg | Arg | Leu | Gly | Met | Lys | Asn | Thr | Val | Phe | Lys | Asn | Pro | Thr | Gly | Leu |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Ser | Arg | Glu | Gly | Gln | Val | Ser | Thr | Ala | Lys | Asp | Leu | Ala | Gln | Leu | Ser |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Glu | Ala | Leu | Met | Arg | Asp | Phe | Pro | Glu | Tyr | Tyr | Pro | Leu | Phe | Ser | Ile |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Lys | Ser | Phe | Lys | Phe | Lys | Asn | Ile | Glu | Gln | Asn | Asn | Arg | Asn | Ile | Leu |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Leu | Tyr | Arg | Asp | Asn | Asn | Val | Asn | Gly | Leu | Lys | Ala | Gly | His | Thr | Glu |
| 225 | | | | 230 | | | | | | 235 | | | | | 240 |
| Ser | Gly | Gly | Tyr | Asn | Leu | Ala | Val | Ser | Tyr | Ser | Gly | Asn | Gly | Arg | His |
| | | | 245 | | | | | | 250 | | | | | 255 | |
| Ile | Leu | Val | Ile | Thr | Leu | Gly | Ser | Glu | Ser | Ala | Glu | Thr | Arg | Ala | Ser |
| | | 260 | | | | | | 265 | | | | | 270 | | |

Asp Asn Ser Lys Leu Leu Asn Trp Ala Leu Gln Ala Phe Asp Thr Pro
275 280 285

Lys Ile Tyr Pro Lys Gly Lys Thr Val Ala Gln Ile Gln Ile Ser Gly
290 295 300

Gly Ser Lys Lys Thr Val Arg Ala Gly Phe Leu Lys Glu Ala Tyr Ile
305 310 315 320

Thr Leu Pro His Lys Glu Ala Lys Met Ala Glu Gln Ile Leu Glu Thr
325 330 335

Ile Gln Pro Ile Pro Ala Pro Val Lys Lys Gly Gln Ile Leu Gly Lys
340 345 350

Ile Lys Ile Arg Gln Asn Gly Tyr Thr Ile Ala Glu Lys Glu Ile Val
355 360 365

Ala Leu Glu Asn Val Lys Lys Arg Ser Arg Trp Gln Arg Leu Trp Ala
370 375 380

Cys Leu Thr Gly Gln
385

<210> 1631

<211> 420

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1631

atggacaata agaccaaact gcgcttgggc ggcttgattt tactgaccac cgccggtttta 60
agcctcatta tcgtattgat tgtcgattcc tggccgcttg ccatcctgct tgccgccgtc 120
atcgctcgccg ccgctgcggg cggtttgtt tggacatccc gccgacagca acgccagttt 180
atcgaacgtc tgaaaaaatt cgacatcgat cccgaaaaag gcagaatcaa cgaggcaaac 240
ctgcgccgta tgtaccacag cggcggacaa caccagaaag atgcgattac cctgatctgc 300
ctgtcgcaaa aatgttcggt ggacgaggcg cacgctatgt tcaaaaaacg cccgacacgt 360
caggaaatca atcaaatggc ggcaaaacag tcgcgcggtc agaaacgtcc gcaccggttaa 420

<210> 1632

<211> 139

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1632

Met Asp Asn Lys Thr Lys Leu Arg Leu Gly Gly Leu Ile Leu Leu Thr
1 5 10 15

Thr Ala Val Leu Ser Leu Ile Ile Val Leu Ile Val Asp Ser Trp Pro
20 25 30

Leu Ala Ile Leu Leu Ala Ala Val Ile Val Ala Ala Ala Gly Gly
35 40 45

Phe Val Trp Thr Ser Arg Arg Gln Gln Arg Gln Phe Ile Glu Arg Leu

50

55

60

Lys Lys Phe Asp Ile Asp Pro Glu Lys Gly Arg Ile Asn Glu Ala Asn
65 70 75 80

Leu Arg Arg Met Tyr His Ser Gly Gly Gln His Gln Lys Asp Ala Ile
85 90 95

Thr Leu Ile Cys Leu Ser Gln Lys Cys Ser Val Asp Glu Ala His Ala
100 105 110

Met Phe Lys Lys Arg Pro Thr Arg Gln Glu Ile Asn Gln Met Ala Ala
115 120 125

Lys Gln Ser Arg Gly Gln Lys Arg Pro His Arg
130 135

<210> 1633

<211> 420

<212> DNA

<213> Neisseria meningitidis

<400> 1633

atggacaata agaccaaact gcgcttgggc ggctgattt tactgaccac cgccgtttta 60
agcctcatta tcgtattgat tgtcgattcc tggcgcgttg ccattcctgct tgcagccgtc 120
attgtcgtcg ccgctgcggg cggttttgtt tggacatccc gccgacagca acgccagttt 180
atcgaaacgcc tgaaaaaatt cgacatcgat cccgaaaaag gcagaatcaa cgaggcaaac 240
ctgcgcgcgt tgtaccacag cggcggacaa caccagaaag atgcgattac cctgatctgc 300
ctgtcgcaaa aatgttcggt ggacgaggcg cacgctatgt tcaaaaaacg cccgacacgt 360
caggaaatca atcaaatggc ggcaaaacag tcgcgcggtc agaaacgtcc gcaccgttaa 420

<210> 1634

<211> 139

<212> PRT

<213> Neisseria meningitidis

<400> 1634

Met Asp Asn Lys Thr Lys Leu Arg Leu Gly Gly Leu Ile Leu Leu Thr
1 5 10 15

Thr Ala Val Leu Ser Leu Ile Ile Val Leu Ile Val Asp Ser Trp Pro
20 25 30

Leu Ala Ile Leu Leu Ala Ala Val Ile Val Ala Ala Ala Gly Gly
35 40 45

Phe Val Trp Thr Ser Arg Arg Gln Gln Arg Gln Phe Ile Glu Arg Leu
50 55 60

Lys Lys Phe Asp Ile Asp Pro Glu Lys Gly Arg Ile Asn Glu Ala Asn
65 70 75 80

Leu Arg Arg Met Tyr His Ser Gly Gly Gln His Gln Lys Asp Ala Ile
85 90 95

Thr Leu Ile Cys Leu Ser Gln Lys Cys Ser Val Asp Glu Ala His Ala
 100 105 110

Met Phe Lys Lys Arg Pro Thr Arg Gln Glu Ile Asn Gln Met Ala Ala
 115 120 125

Lys Gln Ser Arg Gly Gln Lys Arg Pro His Arg
 130 135

<210> 1635
 <211> 420
 <212> DNA
 <213> Neisseria meningitidis

<400> 1635
 atggacaata agaccaaact gcgcttgggc ggcctgattt tactgaccac cgccgtttta 60
 agcctcatta tcgtattgat tgtcgattcc tggccgcttg ccatacctgct tgccgccgctc 120
 atcgtcgccg ccgctgcggg cggctttggt tggacatccc gccgacagca acgccagttt 180
 atcgaacgtc tgaaaaaatt cgacatcgat ccgaaaaaag gcagaatcaa cgaggcaaac 240
 ctgcgcgcta tgtaccacag cggcggacaa caccaaaaag atgcgattac cctgatctgc 300
 ctgtcgcaaa aatgttcggt ggacgaggcg cacgctatgt tcaaaaaacg cccgacacgt 360
 caggaaatca atcaaatggc ggcaaaacag tcgcgcggtc agaaacgtcc gcaccgttaa 420

<210> 1636
 <211> 139
 <212> PRT
 <213> Neisseria meningitidis

<400> 1636
 Met Asp Asn Lys Thr Lys Leu Arg Leu Gly Gly Leu Ile Leu Leu Thr
 1 5 10 15

Thr Ala Val Leu Ser Leu Ile Ile Val Leu Ile Val Asp Ser Trp Pro
 20 25 30

Leu Ala Ile Leu Leu Ala Ala Val Ile Val Ala Ala Ala Gly Gly
 35 40 45

Phe Val Trp Thr Ser Arg Arg Gln Gln Arg Gln Phe Ile Glu Arg Leu
 50 55 60

Lys Lys Phe Asp Ile Asp Pro Glu Lys Gly Arg Ile Asn Glu Ala Asn
 65 70 75 80

Leu Arg Arg Met Tyr His Ser Gly Gly Gln His Gln Lys Asp Ala Ile
 85 90 95

Thr Leu Ile Cys Leu Ser Gln Lys Cys Ser Val Asp Glu Ala His Ala
 100 105 110

Met Phe Lys Lys Arg Pro Thr Arg Gln Glu Ile Asn Gln Met Ala Ala
 115 120 125

Lys Gln Ser Arg Gly Gln Lys Arg Pro His Arg
 130 135

<210> 1637
<211> 480
<212> DNA
<213> Neisseria gonorrhoeae

<400> 1637
atgaacaaaa tattccttac tgccgcagcc ttggtgctgg gcgcgtgcgg tttccacctg 60
aaaggtgcag acggcatttc tccgccgctg acctaccgga gctggcacat cgaaggcgga 120
caggcattgc aatttccttt ggaaaccgcg ctgtatcagg cttcgggcag ggtggacgat 180
gctgccggcg cgcagatgac cctgcgtata gacagcgttt cccaaaacaa ggaaacctat 240
accgttacct gtgcggcagt catcaacgaa tatcttttga tattgacggt tgaagcgag 300
gtattgaaac gcggcgagcc ggtcggcaaa ccgatgaccg tgtccgtccg ccgcattttg 360
gattatgccg acaacgaaat tttgggcaaa .caggaagaag aagaaaccct gtgggcggaa 420
atgcggcagg atgttgccga acagattgtc cgccgcctga cctttctgaa ggcggaatga 480

<210> 1638
<211> 159
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1638
Met Asn Lys Ile Phe Leu Thr Ala Ala Ala Leu Val Leu Gly Ala Cys
1 5 10 15
Gly Phe His Leu Lys Gly Ala Asp Gly Ile Ser Pro Pro Leu Thr Tyr
20 25 30
Arg Ser Trp His Ile Glu Gly Gly Gln Ala Leu Gln Phe Pro Leu Glu
35 40 45
Thr Ala Leu Tyr Gln Ala Ser Gly Arg Val Asp Asp Ala Ala Gly Ala
50 55 60
Gln Met Thr Leu Arg Ile Asp Ser Val Ser Gln Asn Lys Glu Thr Tyr
65 70 75 80
Thr Val Thr Arg Ala Ala Val Ile Asn Glu Tyr Leu Leu Ile Leu Thr
85 90 95
Val Glu Ala Gln Val Leu Lys Arg Gly Glu Pro Val Gly Lys Pro Met
100 105 110
Thr Val Ser Val Arg Arg Ile Leu Asp Tyr Ala Asp Asn Glu Ile Leu
115 120 125
Gly Lys Gln Glu Glu Glu Glu Thr Leu Trp Ala Glu Met Arg Gln Asp
130 135 140
Val Ala Glu Gln Ile Val Arg Arg Leu Thr Phe Leu Lys Ala Glu
145 150 155

<210> 1639
<211> 480

<212> DNA
<213> *Neisseria meningitidis*

<400> 1639

```
atgaacaaac tgtttcttac tgccgcagtg ctgatgctgg gcgcgtgcgg ttccacctg 60
aaaggtgcag acggcatttc tccgccgctg acctaccgga gctggcacat cgaaggcgga 120
caggcattgc ggtttccttt ggaaaccgcg ctgtatcagg cttcgggcag ggtggacgat 180
gctgccggcg cgcagatgac cctgcgtata gacagcgttt cccaaaacaa ggaaacctac 240
accgttacct gtgcggcagc catcaacgaa tatcttttga tattgacggt tgaagcgcag 300
gtattgaaac gcggcgagcc ggtcggtaaa ccgatgaccg tgtccgtccg ccgcgtcctt 360
gcttatgccg acaacgagat cttgggcaaa caggaagagg aagcggcatt gtgggcggaa 420
atgcggcagg atgccgccga acagattgtc cgccgcctga ctttctgaa ggcggaatga 480
```

<210> 1640

<211> 159

<212> PRT

<213> *Neisseria meningitidis*

<400> 1640

```
Met Asn Lys Leu Phe Leu Thr Ala Ala Val Leu Met Leu Gly Ala Cys
  1             5             10             15
```

```
Gly Phe His Leu Lys Gly Ala Asp Gly Ile Ser Pro Pro Leu Thr Tyr
          20             25             30
```

```
Arg Ser Trp His Ile Glu Gly Gly Gln Ala Leu Arg Phe Pro Leu Glu
          35             40             45
```

```
Thr Ala Leu Tyr Gln Ala Ser Gly Arg Val Asp Asp Ala Ala Gly Ala
          50             55             60
```

```
Gln Met Thr Leu Arg Ile Asp Ser Val Ser Gln Asn Lys Glu Thr Tyr
          65             70             75             80
```

```
Thr Val Thr Arg Ala Ala Val Ile Asn Glu Tyr Leu Leu Ile Leu Thr
          85             90             95
```

```
Val Glu Ala Gln Val Leu Lys Arg Gly Glu Pro Val Gly Lys Pro Met
          100            105            110
```

```
Thr Val Ser Val Arg Arg Val Leu Ala Tyr Ala Asp Asn Glu Ile Leu
          115            120            125
```

```
Gly Lys Gln Glu Glu Glu Ala Ala Leu Trp Ala Glu Met Arg Gln Asp
          130            135            140
```

```
Ala Ala Glu Gln Ile Val Arg Arg Leu Thr Phe Leu Lys Ala Glu
          145            150            155
```

<210> 1641

<211> 480

<212> DNA

<213> *Neisseria meningitidis*

<400> 1641

atgaacaaac tgtttcttac tgccgcagtg ctgatgctgg gcgcgtgcgg tttccacctg 60
 aaaggtgcag acggcatttc tccgccgctg acctaccgga gctggcacat cgaaggcgga 120
 caggcattgc agtttccctt ggaaaccgcg ctgtatcagg cttcgggtag ggtggacgat 180
 gctgccggcg cgcagatgac cctgcgtata gacagcgttt cccaaaacaa ggaaacctac 240
 accgttaccg gtgcggcagt catcaacgaa tatcttttga tattgacggt tgaagcgag 300
 gtattgaaac gcggcgagcc ggtcggcaaa ccgatgaccg tgtccgtccg ccgcgtcctt 360
 gcttatgccg acaacgagat cttgggcaaa caggaagagg aagcggcatt gtgggcggaa 420
 atgcggcagg atgccgccga acagattgtc cgccgcctga cctttctgaa ggcggaatga 480

<210> 1642
 <211> 159
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1642
 Met Asn Lys Leu Phe Leu Thr Ala Ala Val Leu Met Leu Gly Ala Cys
 1 5 10 15
 Gly Phe His Leu Lys Gly Ala Asp Gly Ile Ser Pro Pro Leu Thr Tyr
 20 25 30
 Arg Ser Trp His Ile Glu Gly Gly Gln Ala Leu Gln Phe Pro Leu Glu
 35 40 45
 Thr Ala Leu Tyr Gln Ala Ser Gly Arg Val Asp Asp Ala Ala Gly Ala
 50 55 60
 Gln Met Thr Leu Arg Ile Asp Ser Val Ser Gln Asn Lys Glu Thr Tyr
 65 70 75 80
 Thr Val Thr Arg Ala Ala Val Ile Asn Glu Tyr Leu Leu Ile Leu Thr
 85 90 95
 Val Glu Ala Gln Val Leu Lys Arg Gly Glu Pro Val Gly Lys Pro Met
 100 105 110
 Thr Val Ser Val Arg Arg Val Leu Ala Tyr Ala Asp Asn Glu Ile Leu
 115 120 125
 Gly Lys Gln Glu Glu Glu Ala Ala Leu Trp Ala Glu Met Arg Gln Asp
 130 135 140
 Ala Ala Glu Gln Ile Val Arg Arg Leu Thr Phe Leu Lys Ala Glu
 145 150 155

<210> 1643
 <211> 321
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1643
 atggatgctt gttttttcgt cattccccga caggcgggaa ttcggagatt cgggattggt 60
 ttcaaacgtt cgggtcggat tcttgccggt gcgggaatga tgcccttata tactttctcc 120
 gagctttata tgcttcaaca ggggacggca catcaagcac cgcaactgcgt gttgcccga 180

cgaggctgcc ctccgattag attctatcgc tataaacaga cgggtttcaa ccgaaaagga 240
 atggggataa agtccatttc cgacacctct cgggcgatgc cgtctgaaaa ccaatctcca 300
 ctttcagacg gcattgttta g 321

<210> 1644
 <211> 106
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1644
 Met Asp Ala Cys Phe Phe Val Ile Pro Ala Gln Ala Gly Ile Arg Arg
 1 5 10 15
 Phe Gly Ile Val Phe Lys Arg Ser Gly Arg Ile Leu Ala Gly Ala Gly
 20 25 30
 Met Met Pro Leu Tyr Thr Phe Ser Glu Leu Tyr Met Leu Gln Gln Gly
 35 40 45
 Thr Ala His Gln Ala Pro His Cys Val Leu Pro Glu Arg Gly Cys Pro
 50 55 60
 Pro Ile Arg Phe Tyr Arg Tyr Lys Gln Thr Gly Phe Asn Arg Lys Gly
 65 70 75 80
 Met Gly Ile Lys Ser Ile Ser Asp Thr Ser Arg Ala Met Pro Ser Glu
 85 90 95
 Asn Gln Ser Pro Leu Ser Asp Gly Ile Val
 100 105

<210> 1645
 <211> 321
 <212> DNA
 <213> Neisseria meningitidis

<400> 1645
 atgaatgctt gttttttcgt cattcccaca caggcgggaa ttcggagatt cgggattggt 60
 ttcaaacggt cgggtcggat tcttgccggt gcaggaatga tgcccttata tactttctcc 120
 gagctttata tgtttcaaca ggggacggca catcaagcac cgcactgcgt gttgcccga 180
 cgagactacc ctccgattag attctatcgc cataaacaga cgggtttcaa ccgaaaagga 240
 atggggataa agtccatttc cgacatctst cgggcgatgc cgtctgaaaa ccaatctcca 300
 ctttcagacg gcattgttta g 321

<210> 1646
 <211> 106
 <212> PRT
 <213> Neisseria meningitidis

<400> 1646
 Met Asn Ala Cys Phe Phe Val Ile Pro Thr Gln Ala Gly Ile Arg Arg
 1 5 10 15
 Phe Gly Ile Val Phe Lys Arg Ser Gly Arg Ile Leu Ala Gly Ala Gly

20

25

30

Met Met Pro Leu Tyr Thr Phe Ser Glu Leu Tyr Met Phe Gln Gln Gly
35 40 45

Thr Ala His Gln Ala Pro His Cys Val Leu Pro Glu Arg Asp Tyr Pro
50 55 60

Pro Ile Arg Phe Tyr Arg His Lys Gln Thr Gly Phe Asn Arg Lys Gly
65 70 75 80

Met Gly Ile Lys Ser Ile Ser Asp Ile Xaa Arg Ala Met Pro Ser Glu
85 90 95

Asn Gln Ser Pro Leu Ser Asp Gly Ile Val
100 105

<210> 1647

<211> 426

<212> DNA

<213> Neisseria meningitidis

<400> 1647

atgaatgctt gttttttcgt cattcccaca caggcgggaa ttcggagatt cgggattggt 60
ttcaaacgtt cgggtcggat tcttgccggt gcgggaatga tgcccttata tatagtggat 120
taaatttaaa tcaggacaag gcgacgaagc cgcagacagt acaaatagta cggcaaggcg 180
aggcaacgcc gtactggttt aaatttaatc cactatactt tctccgagct ttatatgttt 240
caacagagga cggcacatca agcaccgcac tgcgtgttgc ccgaacgaga ctgccctccg 300
attagattct atcgctataa acagacgggt ttcaaccgaa aaggaatggg aatgaagtcc 360
gtttccgaca cctctcgggc gatgcgctct gaaaaccaat ctccactttc agacggcatt 420
gttttag 426

<210> 1648

<211> 138

<212> PRT

<213> Neisseria meningitidis

<400> 1648

Met Asn Ala Cys Phe Phe Val Ile Pro Thr Gln Ala Gly Ile Arg Arg
1 5 10 15

Phe Gly Ile Val Phe Lys Arg Ser Gly Arg Ile Leu Ala Gly Ala Gly
20 25 30

Met Met Pro Leu Tyr Ile Val Asp Ile Ile Arg Thr Arg Arg Arg Ser
35 40 45

Arg Arg Gln Tyr Lys Tyr Gly Lys Ala Arg Gln Arg Arg Thr Gly Leu
50 55 60

Asn Leu Ile His Tyr Thr Phe Ser Glu Leu Tyr Met Phe Gln Gln Arg
65 70 75 80

Thr Ala His Gln Ala Pro His Cys Val Leu Pro Glu Arg Asp Cys Pro
85 90 95

Pro Ile Arg Phe Tyr Arg Tyr Lys Gln Thr Gly Phe Asn Arg Lys Gly
 100 105 110

Met Gly Met Lys Ser Val Ser Asp Thr Ser Arg Ala Met Pro Ser Glu
 115 120 125

Asn Gln Ser Pro Leu Ser Asp Gly Ile Val
 130 135

<210> 1649

<211> 744

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1649

```

atgtctcatca tccgcaacct gatttactgg ctgatactct gttccagcct gattttctctc 60
tttcccttta tgctgctcgc ctgcgctttc cgggacgggg cgcacaagat ggcgcggggtc 120
tgggtcggca tcctcaactg gtcgctcaaa cacatcgctg ggctcaaata ccgcatcatc 180
ggcgcggaac acattccgga ccgcccctcc gtcactctgc ccaaacacca aagcggctgg 240
gaaacgctcg cgctccaaga gatttttccg ccgcagggtt acgttgccaa gcgcgagttg 300
ttcaaaatcc cttttttcgg ctgggggcttg aaactgggtc aaaccatagg catagaccgc 360
aacaaccgcc gcgaagccaa cgaacagctc ataaaacagg gtttggcgcg caaaaacgaa 420
ggttattgga ttaccatttt ccccgaggc acgcgccttg cgcccggaac acgcggcaaa 480
taciaactcg gcggcgcgcg catggcgaaa atgtttgaga tggacatcgt ccccgctcgcc 540
ctcaacagcg gcgaattttg gccgaaaaat tcctttctga aatatccggg ggaaatcacc 600
gtcatcatct gtccgaccat cccgcacgca agcggcagcg aagccgaatt gatggaaaaa 660
tgcaaacacc tcattgaaac gcaacaaccg cttattttccg gcgcaggccc gtttgccgcc 720
gaaatgccgt ctgaaaccgc atga 744

```

<210> 1650

<211> 246

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1650

Met Leu Ile Ile Arg Asn Leu Ile Tyr Trp Leu Ile Leu Cys Ser Ser
 1 5 10 15

Leu Ile Phe Leu Phe Pro Phe Met Leu Leu Ala Ser Pro Phe Arg Asp
 20 25 30

Gly Ala His Lys Met Ala Arg Val Trp Val Gly Ile Leu Asn Trp Ser
 35 40 45

Leu Lys His Ile Val Gly Leu Lys Tyr Arg Ile Ile Gly Ala Glu His
 50 55 60

Ile Pro Asp Arg Pro Ser Val Ile Cys Ala Lys His Gln Ser Gly Trp
 65 70 75 80

Glu Thr Leu Ala Leu Gln Glu Ile Phe Pro Pro Gln Val Tyr Val Ala
 85 90 95

Lys Arg Glu Leu Phe Lys Ile Pro Phe Phe Gly Trp Gly Leu Lys Leu
 100 105 110
 Val Lys Thr Ile Gly Ile Asp Arg Asn Asn Arg Arg Glu Ala Asn Glu
 115 120 125
 Gln Leu Ile Lys Gln Gly Leu Ala Arg Lys Asn Glu Gly Tyr Trp Ile
 130 135 140
 Thr Ile Phe Pro Glu Gly Thr Arg Leu Ala Pro Gly Lys Arg Gly Lys
 145 150 155 160
 Tyr Lys Leu Gly Gly Ala Arg Met Ala Lys Met Phe Glu Met Asp Ile
 165 170 175
 Val Pro Val Ala Leu Asn Ser Gly Glu Phe Trp Pro Lys Asn Ser Phe
 180 185 190
 Leu Lys Tyr Pro Gly Glu Ile Thr Val Ile Ile Cys Pro Thr Ile Pro
 195 200 205
 His Ala Ser Gly Ser Glu Ala Glu Leu Met Glu Lys Cys Glu His Leu
 210 215 220
 Ile Glu Thr Gln Gln Pro Leu Ile Ser Gly Ala Gly Pro Phe Ala Ala
 225 230 235 240
 Glu Met Pro Ser Glu Thr
 245

<210> 1651

<211> 744

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1651

atgctcatca tccgcaacct gatttactgg ctgatactct gttccaccct gattttcctc 60
 tttcccttta tgctgctcgc ctgcgctttc cgggacgggg cgcacaagat ggcgcggggtc 120
 tgggtcggca ttctcaactg gtcgctcaaa cacatcgtcg ggctcaaata ccgcatcatc 180
 ggcgcggaaa acatccccga ccgccccgcc gtcactctgcg ccaaacacca aagcggctgg 240
 gaaacgctcg cccttcagga catttttccg ccgcagggtt acgttgccaa acgcgagttg 300
 ttcaaaatcc cttttttcgg ctggggcttg aaactggtca aaaccatagg catagaccgc 360
 aacaaccgcc gcgaagccaa cgagcagctc ataaaacagg ggttggtgcg caaaaacgaa 420
 ggctattgga ttaccatttt ccccgaaggc acgcgccttg cggccgaaa acgcggcaaa 480
 tacaaactcg gcggcgcgcg catggcgaaa atgtttgaga tggacatcgt ccccgtcgcc 540
 ctcaacagcg gcgaattttg gccgaaaaac tcctttctga aatatccggg ggaaatcacc 600
 gtcgtcatct gtccgaccat cccgcacgca agcggcagcg aagccgaatt gatggaaaaa 660
 tgcgaaacat tcacgaaac gcaacaaccg cttatttccg gcgcaggccc gtttgccgcc 720
 aaaatgccgt ctgaaaccgc atga 744

<210> 1652

<211> 247

<212> PRT

<213> Neisseria meningitidis

<400> 1652

Met Leu Ile Ile Arg Asn Leu Ile Tyr Trp Leu Ile Leu Cys Ser Thr
1 5 10 15

Leu Ile Phe Leu Phe Pro Phe Met Leu Leu Ala Ser Pro Phe Arg Asp
20 25 30

Gly Ala His Lys Met Ala Arg Val Trp Val Gly Ile Leu Asn Trp Ser
35 40 45

Leu Lys His Ile Val Gly Leu Lys Tyr Arg Ile Ile Gly Ala Glu Asn
50 55 60

Ile Pro Asp Arg Pro Ala Val Ile Cys Ala Lys His Gln Ser Gly Trp
65 70 75 80

Glu Thr Leu Ala Leu Gln Asp Ile Phe Pro Pro Gln Val Tyr Val Ala
85 90 95

Lys Arg Glu Leu Phe Lys Ile Pro Phe Phe Gly Trp Gly Leu Lys Leu
100 105 110

Val Lys Thr Ile Gly Ile Asp Arg Asn Asn Arg Arg Glu Ala Asn Glu
115 120 125

Gln Leu Ile Lys Gln Gly Leu Val Arg Lys Asn Glu Gly Tyr Trp Ile
130 135 140

Thr Ile Phe Pro Glu Gly Thr Arg Leu Ala Pro Gly Lys Arg Gly Lys
145 150 155 160

Tyr Lys Leu Gly Gly Ala Arg Met Ala Lys Met Phe Glu Met Asp Ile
165 170 175

Val Pro Val Ala Leu Asn Ser Gly Glu Phe Trp Pro Lys Asn Ser Phe
180 185 190

Leu Lys Tyr Pro Gly Glu Ile Thr Val Val Ile Cys Pro Thr Ile Pro
195 200 205

His Ala Ser Gly Ser Glu Ala Glu Leu Met Glu Lys Cys Glu His Leu
210 215 220

Ile Glu Thr Gln Gln Pro Leu Ile Ser Gly Ala Gly Pro Phe Ala Ala
225 230 235 240

Lys Met Pro Ser Glu Thr Ala
245

<210> 1653

<211> 744

<212> DNA

<213> Neisseria meningitidis

<400> 1653

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ggcgcggaata acatccccga ccgccccgcc gtcattctgcg ccaaacacca aagcggctgg 240
gaaacgctcg cccttcagga catttttccg ccgcagggtt acgttgccaa acgcgagttg 300
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aacaaccgcc gcgaagccaa cgagcagctc ataaaacagg ggttggcgcg caaaaacgaa 420
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gtcgtcatct gtccgaccat cccgcacgca agcggcagcg aagccgaatt gatgggaaaa 660
tgcgaaacacc tcatcgaaac gcagcagccg ctcatctccg gcgcaggccc gtttgccgcc 720
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<210> 1654

<211> 247

<212> PRT

<213> Neisseria meningitidis

<400> 1654

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Met Leu Ile Ile Arg Asn Leu Ile Tyr Trp Leu Ile Leu Cys Ser Thr
  1             5             10             15

Leu Ile Phe Leu Phe Pro Phe Met Leu Leu Ala Ser Pro Phe Arg Asp
      20             25             30

Gly Ala His Lys Met Ala Arg Val Trp Val Lys Ile Leu Asn Leu Ser
      35             40             45

Leu Lys His Ile Val Gly Leu Lys Tyr Arg Ile Ile Gly Ala Glu Asn
      50             55             60

Ile Pro Asp Arg Pro Ala Val Ile Cys Ala Lys His Gln Ser Gly Trp
      65             70             75             80

Glu Thr Leu Ala Leu Gln Asp Ile Phe Pro Pro Gln Val Tyr Val Ala
      85             90             95

Lys Arg Glu Leu Phe Lys Ile Pro Phe Phe Gly Trp Gly Leu Lys Leu
      100            105            110

Val Lys Thr Ile Gly Ile Asp Arg Asn Asn Arg Arg Glu Ala Asn Glu
      115            120            125

Gln Leu Ile Lys Gln Gly Leu Ala Arg Lys Asn Glu Gly Tyr Trp Ile
      130            135            140

Thr Ile Phe Pro Glu Gly Thr Arg Leu Ala Pro Gly Lys Arg Gly Lys
      145            150            155            160

Tyr Lys Leu Gly Gly Ala Arg Met Ala Lys Met Phe Glu Met Asp Ile
      165            170            175

Val Pro Val Ala Leu Asn Ser Gly Glu Phe Trp Pro Lys Asn Ser Phe
      180            185            190

Leu Lys Tyr Pro Gly Glu Ile Thr Val Val Ile Cys Pro Thr Ile Pro

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195

200

205

His Ala Ser Gly Ser Glu Ala Glu Leu Met Gly Lys Cys Glu His Leu
 210 215 220

Ile Glu Thr Gln Gln Pro Leu Ile Ser Gly Ala Gly Pro Phe Ala Ala
 225 230 235 240

Lys Met Pro Ser Glu Thr Ala
 245

<210> 1655

<211> 1773

<212> DNA

<213> Neisseria meningitidis

<400> 1655

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cgtctggaaa acgcggcctc cgtcatcgaa gaggcgggca acttgagaat gcaggcatac 180
cgtctggcat acatggcggg tgaaggctcg ccccggtgcg aaattgacaa tcagggttgc 240
gaatttgaaa aaagtttaaa acgcattgcc caaagcgatg ccatccatcc gctgattcct 300
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ctgttttggc accagatttg gggttatccg ccgctgcagg cgtaaggga aggtgcggaa 600
cgcacgcggac ggaggtgttt cgatattccg gttcccgaag gcggtacgcc ggaattcaaa 660
caggtcgggc gttgtttcaa tcaaatgggc ggcaggttga aaattttata tgatgatttg 720
gaaggacaag tcgccgagca gacacgcagt ctcgaaaaac aaaatcaaaa cctgaccctg 780
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gcattaacgt tcctaaacct acaggtacag atgctggaaa ccgcctttgc cgaaaacaaa 1260
cgggaggaag ccgcagaaaa catcagcttt atcaaaacag gcgtgcagga atgttatgaa 1320
gatgtccgcg aactgctgct caacttccgt accaaaatca gcaataaaga atttcccgaa 1380
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tccgaacacg gcggacgctt taccatgacc atccaagaca acggacaagg tttcgacacg 1620
gagaaaaatg gagaaccac gccagccat gtcggactgc acatcatgca ggagcgtgcc 1680
aaacgcatcc atgccgtttt agaaatccgt tcccaagctc aacagggaac caccgtctca 1740
ttgacgggtg catctgaaga aagcttgaaa tga 1773

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<210> 1656

<211> 590

<212> PRT

<213> Neisseria meningitidis

<400> 1656

Met Ile Leu Pro Ala Arg Phe Ser Asp Gly Ile Ser Leu Ser Leu Arg
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 Leu Lys Leu Leu Thr Gly Leu Trp Val Gly Leu Ala Ala Leu Ser Val
 20 25 30
 Val Leu Thr Leu Leu Leu Ser Leu Arg Leu Glu Asn Ala Ala Ser Val
 35 40 45
 Ile Glu Glu Ala Gly Asn Leu Arg Met Gln Ala Tyr Arg Leu Ala Tyr
 50 55 60
 Met Ala Gly Glu Gly Ser Pro Arg Ala Gln Ile Asp Asn Gln Val Ala
 65 70 75 80
 Glu Phe Glu Lys Ser Leu Lys Arg Ile Ala Gln Ser Asp Ala Ile His
 85 90 95
 Pro Leu Ile Pro Ser Asp Thr Pro Leu Ala Tyr Asp Leu Ile Gln Ser
 100 105 110
 Met Leu Ile Ile Asp Trp Gln Ala His Ile Leu Pro Pro Leu Gln Ser
 115 120 125
 Tyr Arg Arg Pro Thr Gln Val Asp Leu Tyr Arg Phe Ala Gly Asn Ile
 130 135 140
 Glu Leu Phe Leu Gln Ala Leu Glu Asn Ala Asn Glu Lys Asn Thr Trp
 145 150 155 160
 Trp Leu Arg Arg Phe Gln Trp Ala Ile Met Leu Met Thr Leu Val Ser
 165 170 175
 Ser Val Leu Met Leu Phe Trp His Gln Ile Trp Val Ile Arg Pro Leu
 180 185 190
 Gln Ala Leu Arg Glu Gly Ala Glu Arg Ile Gly Arg Arg Cys Phe Asp
 195 200 205
 Ile Pro Val Pro Glu Gly Gly Thr Pro Glu Phe Lys Gln Val Gly Arg
 210 215 220
 Cys Phe Asn Gln Met Gly Gly Arg Leu Lys Ile Leu Tyr Asp Asp Leu
 225 230 235 240
 Glu Gly Gln Val Ala Glu Gln Thr Arg Ser Leu Glu Lys Gln Asn Gln
 245 250 255
 Asn Leu Thr Leu Leu Tyr Gln Thr Thr Arg Asp Leu His Gln Ser Tyr
 260 265 270
 Ile Pro Gln Gln Ala Ala Glu His Phe Leu Asn Arg Ile Leu Pro Ala
 275 280 285
 Val Gly Ala Asp Ser Gly Arg Val Cys Leu Asp Gly Gly Ser Asp Val
 290 295 300

Tyr Val Ser Ile His His Ala Asp Cys Gly Thr Ala Ala Ser Asp Leu
 305 310 315 320
 Gly Lys Tyr His Glu Glu Ile Phe Pro Ile Glu Tyr Gln Asn Glu Thr
 325 330 335
 Leu Gly Arg Leu Leu Leu Ser Phe Pro Asn Gly Ile Ser Leu Asp Glu
 340 345 350
 Asp Asp Arg Ile Leu Leu Gln Thr Leu Gly Arg Gln Leu Gly Val Ser
 355 360 365
 Leu Ala Gly Ala Lys Gln Glu Glu Lys Arg Leu Leu Ala Val Leu
 370 375 380
 Gln Glu Arg Asn Leu Ile Ala Gln Gly Leu His Asp Ser Ile Ala Gln
 385 390 395 400
 Ala Leu Thr Phe Leu Asn Leu Gln Val Gln Met Leu Glu Thr Ala Phe
 405 410 415
 Ala Glu Asn Lys Arg Glu Glu Ala Ala Glu Asn Ile Ser Phe Ile Lys
 420 425 430
 Thr Gly Val Gln Glu Cys Tyr Glu Asp Val Arg Glu Leu Leu Leu Asn
 435 440 445
 Phe Arg Thr Lys Ile Ser Asn Lys Glu Phe Pro Glu Ala Val Ala Asp
 450 455 460
 Leu Phe Ala Arg Phe Thr Gln Gln Thr Gly Ile Thr Val Glu Thr Ala
 465 470 475 480
 Trp Glu Asn Gly Ser Phe Leu Pro Pro Gln Glu Ala Gln Leu Gln Met
 485 490 495
 Ile Phe Ile Leu Gln Glu Ser Leu Ser Asn Ile Arg Lys His Ala Arg
 500 505 510
 Ala Thr His Val Lys Phe Thr Leu Ser Glu His Gly Gly Arg Phe Thr
 515 520 525
 Met Thr Ile Gln Asp Asn Gly Gln Gly Phe Asp Thr Glu Lys Ile Gly
 530 535 540
 Glu Pro Thr Gly Ser His Val Gly Leu His Ile Met Gln Glu Arg Ala
 545 550 555 560
 Lys Arg Ile His Ala Val Leu Glu Ile Arg Ser Gln Ala Gln Gln Gly
 565 570 575
 Thr Thr Val Ser Leu Thr Val Ala Ser Glu Glu Ser Leu Lys
 580 585 590

<210> 1657

<211> 1773

<212> DNA

<213> *Neisseria meningitidis*

<400> 1657

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cgtctggaaa acgcggcctc cgtcatcgaa gaggcgggca acttgagaat gcaggcatac 180
cgtctggcat acatggcggg tgaaggctcg ccccgctgcg aaattgacaa tcagggttgc 240
gaatttgaaa aaagtttaaa acgcattgcc caaagcgatg ccatccatcc gctgattcct 300
tcggacacccc ctcttgctta tgatttgata caatccatgc tgattataga ttggcaggca 360
cacatcctcc ccccgctcca gtcctaccgg cgaccgactc aggtcgatct ctaccgcttt 420
gccggaaaaca tcgaactgtt tttgcaggca ttggaaaatg ccaacgaaaa aaacacatgg 480
tggtcagagg gttttcaatg ggcaattatg ttgatgacgc tgggtgtcgtc tgtactgatg 540
ctgttttggc accagatttg ggttatccgg ccgctgcagg cgttaaggga aggtgcggaa 600
cgcacgggac ggaggtgttt cgatattccg gttcccgaag gcggtacgcc ggaattcaaa 660
caggtcgggc gttgtttcaa tcaaatgggc ggcagggtga aaattttata tgatgatttg 720
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gaaaacattg gagaaccatc gggcagccat gtcggactgc atatcatgca ggagcgtgcc 1680
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ttgacggttg catctgaaga aagcttgaaa tga 1773
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<210> 1658

<211> 590

<212> PRT

<213> *Neisseria meningitidis*

<400> 1658

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Met Ile Leu Pro Ala Arg Phe Ser Asp Gly Ile Ser Leu Ser Leu Arg
  1             5             10            15

Leu Lys Leu Leu Thr Gly Leu Trp Val Gly Leu Ala Ala Leu Ser Val
      20             25            30

Val Leu Thr Leu Leu Leu Ser Leu Arg Leu Glu Asn Ala Ala Ser Val
      35             40            45

Ile Glu Glu Ala Gly Asn Leu Arg Met Gln Ala Tyr Arg Leu Ala Tyr
      50             55            60

Met Ala Gly Glu Gly Ser Pro Arg Ala Gln Ile Asp Asn Gln Val Ala
      65             70            75            80
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| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Phe | Glu | Lys | Ser | Leu | Lys | Arg | Ile | Ala | Gln | Ser | Asp | Ala | Ile | His | 85 | 90 | 95 |
| Pro | Leu | Ile | Pro | Ser | Asp | Thr | Pro | Leu | Ala | Tyr | Asp | Leu | Ile | Gln | Ser | 100 | 105 | 110 |
| Met | Leu | Ile | Ile | Asp | Trp | Gln | Ala | His | Ile | Leu | Pro | Pro | Leu | Gln | Ser | 115 | 120 | 125 |
| Tyr | Arg | Arg | Pro | Thr | Gln | Val | Asp | Leu | Tyr | Arg | Phe | Ala | Gly | Asn | Ile | 130 | 135 | 140 |
| Glu | Leu | Phe | Leu | Gln | Ala | Leu | Glu | Asn | Ala | Asn | Glu | Lys | Asn | Thr | Trp | 145 | 150 | 155 |
| Trp | Leu | Arg | Arg | Phe | Gln | Trp | Ala | Ile | Met | Leu | Met | Thr | Leu | Val | Ser | 165 | 170 | 175 |
| Ser | Val | Leu | Met | Leu | Phe | Trp | His | Gln | Ile | Trp | Val | Ile | Arg | Pro | Leu | 180 | 185 | 190 |
| Gln | Ala | Leu | Arg | Glu | Gly | Ala | Glu | Arg | Ile | Gly | Arg | Arg | Cys | Phe | Asp | 195 | 200 | 205 |
| Ile | Pro | Val | Pro | Glu | Gly | Gly | Thr | Pro | Glu | Phe | Lys | Gln | Val | Gly | Arg | 210 | 215 | 220 |
| Cys | Phe | Asn | Gln | Met | Gly | Gly | Arg | Leu | Lys | Ile | Leu | Tyr | Asp | Asp | Leu | 225 | 230 | 235 |
| Glu | Gly | Gln | Val | Ala | Glu | Gln | Thr | Arg | Ser | Leu | Glu | Lys | Gln | Asn | Gln | 245 | 250 | 255 |
| Asn | Leu | Thr | Leu | Leu | Tyr | Gln | Thr | Thr | Arg | Asp | Leu | His | Gln | Ser | Tyr | 260 | 265 | 270 |
| Ile | Pro | Gln | Gln | Ala | Ala | Glu | His | Phe | Leu | Asn | Arg | Ile | Leu | Pro | Ala | 275 | 280 | 285 |
| Val | Gly | Ala | Asp | Ser | Gly | Arg | Val | Cys | Leu | Asp | Gly | Gly | Ser | Asp | Val | 290 | 295 | 300 |
| Tyr | Val | Ser | Ile | His | His | Ala | Asp | Cys | Gly | Thr | Ala | Ala | Ser | Asp | Leu | 305 | 310 | 315 |
| Gly | Lys | Tyr | His | Glu | Glu | Ile | Phe | Pro | Ile | Glu | Tyr | Gln | Asn | Glu | Thr | 325 | 330 | 335 |
| Leu | Gly | Arg | Leu | Leu | Leu | Ser | Phe | Pro | Asn | Gly | Ile | Ser | Leu | Asp | Glu | 340 | 345 | 350 |
| Asp | Asp | Arg | Ile | Leu | Leu | Gln | Thr | Leu | Gly | Arg | Gln | Leu | Gly | Val | Ser | 355 | 360 | 365 |
| Leu | Ala | Gly | Ala | Lys | Gln | Glu | Glu | Glu | Lys | Arg | Leu | Leu | Ala | Val | Leu | 370 | 375 | 380 |

Gln Glu Arg Asn Leu Ile Ala Gln Gly Leu His Asp Ser Ile Ala Gln
 385 390 395 400
 Ala Leu Thr Phe Leu Asn Leu Gln Val Gln Met Leu Glu Thr Ala Phe
 405 410 415
 Ala Glu Asn Lys Arg Glu Glu Ala Ala Glu Asn Ile Gly Phe Ile Lys
 420 425 430
 Thr Gly Val Gln Glu Cys Tyr Glu Asp Val Arg Glu Leu Leu Leu Asn
 435 440 445
 Phe Arg Thr Lys Ile Ser Asn Lys Glu Phe Pro Glu Ala Val Ala Asp
 450 455 460
 Leu Phe Ser Arg Phe Thr Gln Gln Thr Gly Thr Thr Val Glu Thr Ala
 465 470 475 480
 Trp Glu Asn Gly Thr His Leu Pro Thr Gln Asp Glu Gln Leu Gln Met
 485 490 495
 Ile Phe Ile Leu Gln Glu Ser Leu Ser Asn Ile Arg Lys His Ala His
 500 505 510
 Ala Thr His Ile Lys Phe Arg Leu Leu Lys Gln Asp Gly Ser Phe Thr
 515 520 525
 Met Thr Ile Gln Asp Asn Gly Gln Gly Phe Asp Thr Glu Asn Ile Gly
 530 535 540
 Glu Pro Ser Gly Ser His Val Gly Leu His Ile Met Gln Glu Arg Ala
 545 550 555 560
 Lys Arg Ile His Ala Val Leu Glu Ile Arg Ser Gln Ala Gln Gln Gly
 565 570 575
 Thr Thr Val Ser Leu Thr Val Ala Ser Glu Glu Ser Leu Lys
 580 585 590

<210> 1659

<211> 627

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1659

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 gcgccggttt tggtcggaat catgttttcc acgccgctgc gggcgcggcg cagggtctttg 120
 tggcgacagt cggtaacggt ttggtcgttg gtcagtgcgt ggatggtggt cattgcgcct 180
 ttgacgatgc cgacgctttc gctcaacact ttggcaaccg gcgagaggca gttggtggtg 240
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 aaatcgacac cgagttcttt ccacggcagt tcggcagggt tgcgggtcga gaagaagggg 480
 attttgtcgc cgttgacgat gaggttgccg ccgtcgtggg atacgtcggc ttcaaagcgt 540
 ccgtgtacgg tgtcgaattt ggtcagatgg gcgttggttt caaggctgcc gctggcggtt 600

acggcgacga tttggagttg gtcttga

627

<210> 1660

<211> 208

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1660

Met Ala Ser Pro Ser Ser Leu Pro Phe Asn Ser Gly Lys Thr Lys Pro
1 5 10 15

Thr Ala Phe Ala Ala Pro Val Leu Val Gly Ile Met Phe Ser Thr Pro
20 25 30

Leu Arg Ala Arg Arg Arg Ser Leu Trp Arg Thr Ser Val Thr Val Trp
35 40 45

Ser Leu Val Ser Ala Trp Met Val Val Ile Ala Pro Leu Thr Met Pro
50 55 60

Thr Leu Ser Leu Asn Thr Leu Ala Thr Gly Glu Arg Gln Leu Val Val
65 70 75 80

Gln Glu Ala Leu Glu Thr Thr Val Met Ser Ala Val Arg Thr Leu Ser
85 90 95

Phe Thr Pro Tyr Thr Thr Val Ala Ser Thr Ser Ser Pro Pro Gly Ala
100 105 110

Glu Met Arg Thr Phe Phe Ala Pro Leu Ser Arg Trp Ile Leu Ala Phe
115 120 125

Ser Leu Leu Val Asn Ala Pro Val His Ser Met Thr Lys Ser Thr Pro
130 135 140

Ser Ser Phe His Gly Ser Ser Ala Gly Leu Arg Val Glu Lys Lys Gly
145 150 155 160

Ile Leu Ser Pro Leu Thr Met Arg Leu Pro Pro Ser Trp Asp Thr Ser
165 170 175

Ala Ser Lys Arg Pro Cys Thr Val Ser Asn Leu Val Arg Trp Ala Leu
180 185 190

Val Ser Arg Leu Pro Leu Ala Leu Thr Ala Thr Ile Trp Ser Trp Ser
195 200 205

<210> 1661

<211> 627

<212> DNA

<213> *Neisseria meningitidis*

<400> 1661

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gcgccgggtt tggtcggaat catgttttcc acgccgctgc gggcgcggcg caggtctttg 120
tggcgcacgt cggtaacggt ttggtcgttg gtcagcgcgt ggatgggtgt catcgcgctt 180
ttgacgatgc cgacgctttc gctcaacact ttggcaaccg gcgagaggca gttggtggtg 240
caggaagcgt tggaaacgac ggatcatgtc gcggtcagga cgctgtcgtt cagcccgctac 300
acgacgggtg catcgacatc gtcgccgccc ggtgcggaaa tgaggacttt ttcgcgcgcg 360
ctttcgaggt ggatttttggc tttttctttg ctggtgaacg cgccgggtgca ttccatgacc 420
aaatcgacac cgagttcttt ccacggcagt tcggcagggt tgcgggtcga gaagaagggg 480
attttgtcgc cgttgacgat gaggttgccg ccgtcgtggg atacgtcggc ttcaaagcgt 540
ccgtgcacgg tgtcgaattt ggtcagatgg gcgttggttt caaggctgcc gctggcggtg 600
acggcgacga gttggagttg gtcttga 627
```

<210> 1662

<211> 208

<212> PRT

<213> *Neisseria meningitidis*

<400> 1662

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Met Ala Ser Pro Ser Ser Leu Pro Phe Asn Ser Gly Ser Thr Lys Pro
  1                      5                      10                      15

Thr Ala Phe Ala Ala Pro Val Leu Val Gly Ile Met Phe Ser Thr Pro
                20                      25                      30

Leu Arg Ala Arg Arg Arg Ser Leu Trp Arg Thr Ser Val Thr Val Trp
                35                      40                      45

Ser Leu Val Ser Ala Trp Met Val Val Ile Ala Pro Leu Thr Met Pro
  50                      55                      60

Thr Leu Ser Leu Asn Thr Leu Ala Thr Gly Glu Arg Gln Leu Val Val
  65                      70                      75                      80

Gln Glu Ala Leu Glu Thr Thr Val Met Ser Ala Val Arg Thr Leu Ser
                85                      90                      95

Phe Thr Pro Tyr Thr Thr Val Ala Ser Thr Ser Ser Pro Pro Gly Ala
                100                      105                      110

Glu Met Arg Thr Phe Phe Ala Pro Leu Ser Arg Trp Ile Leu Ala Phe
                115                      120                      125

Ser Leu Leu Val Asn Ala Pro Val His Ser Met Thr Lys Ser Thr Pro
  130                      135                      140

Ser Ser Phe His Gly Ser Ser Ala Gly Leu Arg Val Glu Lys Lys Gly
  145                      150                      155                      160

Ile Leu Ser Pro Leu Thr Met Arg Leu Pro Pro Ser Trp Asp Thr Ser
                165                      170                      175

Ala Ser Lys Arg Pro Cys Thr Val Ser Asn Leu Val Arg Trp Ala Leu
                180                      185                      190

Val Ser Arg Leu Pro Leu Ala Leu Thr Ala Thr Ser Trp Ser Trp Ser
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<210> 1663
 <211> 627
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1663
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 ttgacgatgc cgacgctttc gctcaacact ttggcaaccg gcgagaggca gttggtggtg 240
 caggaagcgt tggaaacgac ggtcatgtcg gcggtcagga tgctgtcgtt cagcccgctac 300
 acgacggttg catcgacatc gtcgccgccc ggtgcggaaa tgaggacttt tttcgcgccg 360
 ctttccagat gaacttttggc tttttctttg ctggtgaacg cgccgggtgca ttccatgacc 420
 aaatcgacac cgagtttctt ccacggcagt tcggcagggg tgcgggtcna gaagaanggg 480
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 Phe Thr Pro Tyr Thr Thr Val Ala Ser Thr Ser Ser Pro Pro Gly Ala
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 Glu Met Arg Thr Phe Phe Ala Pro Leu Ser Arg Thr Leu Ala Phe Ser
 115 120 125
 Leu Leu Val Asn Ala Pro Val His Ser Met Thr Lys Ser Thr Pro Ser
 130 135 140

Ser Phe His Gly Ser Ser Ala Gly Leu Arg Val Xaa Lys Xaa Gly Ile
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Leu Ser Pro Leu Thr Met Arg Leu Pro Pro Ser Trp Asp Thr Ser Ala
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Ser Lys Arg Pro Cys Thr Val Ser Asn Leu Val Arg Trp Ala Leu Val
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<210> 1665

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<212> DNA

<213> Neisseria gonorrhoeae

<400> 1665

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```

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<212> PRT

<213> Neisseria gonorrhoeae

<400> 1666

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```

```

Asp Ser Gly Ser Gly Ser Val Tyr Val Lys Ser Val Ser Phe Ile Pro
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```

```

Thr His Ser Lys Ala Phe Cys Phe Ser Ala Leu Gly Phe Ser Leu Cys
          50           55           60

```

```

Leu Ala Leu Gly Thr Val Asn Ile Ala Phe Ala Asp Gly Ile Ile Thr
          65           70           75           80

```

```

Asp Lys Ala Ala Pro Lys Thr Gln Gln Ala Thr Ile Leu Gln Thr Gly
          85           90           95

```

```

Asn Gly Ile Pro Gln Val Asn Ile Gln Thr Pro Thr Ser Ala Gly Val
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```

```

Ser Val Asn Gln Tyr Ala Gln Phe Asp Val Gly Asn Arg Gly Ala Ile
          115          120          125

```

```

Leu Asn Asn Ser Arg Ser Asn Thr Gln Thr Gln Leu Gly Gly Trp Ile
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```

```

Gln Gly Asn Pro Trp Leu Thr Arg Gly Glu Ala Arg Val Val Val Asn
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```

```

Gln Ile Asn Ser Ser His Pro Ser Gln Leu Asn Gly Tyr Ile Glu Val
          165          170          175

```

```

Gly Gly Arg Arg Ala Glu Val Val Ile Ala Asn Pro Ala Gly Ile Ala
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```

```

Val Asn Gly Gly Gly Phe Ile Asn Ala Ser Arg Ala Thr Leu Thr Thr
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```

```

Gly Gln Pro Gln Tyr Gln Ala Gly Asp Phe Ser Gly Phe Lys Ile Arg

```

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| 225 | 230 | 235 240 |
| Asp Phe Thr Arg | Ile Leu Leu Tyr Ala Asn Lys | Ile Thr Leu Ile Ser |
| | 245 | 250 255 |
| Thr Ala Glu Gln Ala Gly | Ile Arg Asn Gln Gly Gln | Leu Phe Ala Ser |
| | 260 | 265 270 |
| Ser Gly Asn Val Ala Ile | Asp Ala Asn Gly Arg | Leu Val Asn Ser Gly |
| | 275 | 280 285 |
| Thr Met Ala Ala Ala | Asn Val Gln Asp Met | Asn Thr Ala Glu His |
| | 290 | 295 300 |
| Lys Val Asn Ile Arg | Ser Gln Ala Phe Glu | Asn Ser Gly Thr Ala Val |
| 305 | 310 | 315 320 |
| Ser Gln Gln Gly Thr | Gln Ile His Ser Gln | Ser Ile Gln Asn Thr Gly |
| | 325 | 330 335 |
| Lys Leu Leu Ser | Ala Gly Thr Glu Asp | Leu Ala Val Ser Gly Ser Leu |
| | 340 | 345 350 |
| Asn Asn Gln Asn Gly | Glu Ile Ala Thr Asn | Gln Gln Leu Ile Ile His |
| | 355 | 360 365 |
| Asp Gly Gln Gln Ser | Thr Val Val Ile Asp | Asn Thr Asn Gly Thr Ile |
| | 370 | 375 380 |
| Gln Ser Gly Arg Asp | Val Ala Ile Gln Ala | Lys Ser Leu Ser Asn Asn |
| 385 | 390 | 395 400 |
| Gly Thr Leu Ala Ala | Asp Asn Lys Leu Asp | Ile Ala Leu Gln Asp Asp |
| | 405 | 410 415 |
| Phe Tyr Val Glu Arg | Lys Ile Val Ala Gly | Asn Glu Leu Ser Leu Ser |
| | 420 | 425 430 |
| Thr Arg Gly Ser Leu | Lys Asn Ser His Thr | Leu Gln Ala Gly Lys Arg |
| | 435 | 440 445 |
| Ile Arg Ile Lys Ala | Asn Asn Leu Asp Asn | Ala Val Gln Gly Asn Ile |
| | 450 | 455 460 |
| Gln Ser Gly Gly Thr | Thr Asp Ile Gly Thr | Gln His Asn Leu Thr Asn |
| 465 | 470 | 475 480 |
| Arg Gly Leu Ile Asp | Gly Gln Gln Thr Lys | Ile Gln Ala Gly Gln Met |
| | 485 | 490 495 |
| Asn Asn Ile Gly Thr | Gly Arg Ile Tyr Gly | Asp Asn Ile Ala Ile Ala |
| | 500 | 505 510 |
| Ala Thr Arg Leu Asp | Asn Gln Asp Glu Asn | Gly Thr Gly Ala Ala Ile |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Ala | Arg | Glu | Asn | Leu | Asn | Leu | Gly | Ile | Glu | Gln | Leu | Asn | Asn | Arg |
| 530 | | | | | | 535 | | | | | | 540 | | | |
| Glu | Asn | Ser | Leu | Ile | Tyr | Ser | Gly | Asn | Asp | Met | Ala | Val | Gly | Gly | Ala |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 |
| Leu | Asp | Thr | Asn | Asp | Gln | Ala | Thr | Gly | Lys | Ala | Gln | Arg | Ile | His | Asn |
| | | | | 565 | | | | | 570 | | | | | 575 | |
| Ala | Gly | Ala | Ile | Ile | Glu | Ala | Ala | Gly | Lys | Met | Arg | Leu | Gly | Val | Glu |
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| Lys | Leu | His | Asn | Thr | Asn | Glu | His | Leu | Lys | Thr | Gln | Leu | Val | Glu | Thr |
| | | 595 | | | | | 600 | | | | | 605 | | | |
| Gly | Arg | Glu | Arg | Ile | Val | Asp | Tyr | Glu | Ala | Phe | Gly | Arg | His | Glu | Leu |
| | 610 | | | | | | 615 | | | | 620 | | | | |
| Leu | Arg | Glu | Gly | Thr | Gln | His | Glu | Leu | Gly | Trp | Phe | Val | Tyr | Asn | Asn |
| 625 | | | | | 630 | | | | | 635 | | | | | 640 |
| Glu | Ser | Asp | His | Leu | Arg | Thr | Pro | Asp | Gly | Val | Ala | His | Glu | Asn | Trp |
| | | | | 645 | | | | | 650 | | | | | 655 | |
| His | Lys | Tyr | Asp | Tyr | Glu | Lys | Val | Thr | Gln | Glu | Thr | Gln | Val | Thr | Gly |
| | | | 660 | | | | | 665 | | | | | 670 | | |
| Thr | Ala | Pro | Ala | Lys | Ile | Ile | Ala | Gly | Ser | Asp | Leu | Ile | Ile | Asp | Ser |
| | | 675 | | | | | 680 | | | | | 685 | | | |
| Lys | Ala | Val | Phe | Asn | Ser | Asp | Ser | Arg | Ile | Ile | Ala | Gly | Gly | Gln | Leu |
| | 690 | | | | | | 695 | | | | 700 | | | | |
| Leu | Val | Gln | Thr | Glu | Lys | Asp | Gly | Leu | His | Asn | Glu | Gln | Thr | Phe | Gly |
| 705 | | | | | 710 | | | | | 715 | | | | | 720 |
| Glu | Lys | Lys | Val | Phe | Ser | Glu | Asn | Gly | Lys | Leu | His | Asn | Tyr | Trp | Arg |
| | | | | 725 | | | | | 730 | | | | | 735 | |
| Ala | Arg | Arg | Lys | Gly | His | Asp | Glu | Thr | Gly | His | Arg | Glu | Gln | Asn | Tyr |
| | | | 740 | | | | | 745 | | | | | 750 | | |
| Thr | Leu | Pro | Glu | Glu | Ile | Thr | Arg | Asp | Ile | Ser | Leu | Gly | Ser | Phe | Ala |
| | | 755 | | | | | 760 | | | | | 765 | | | |
| Tyr | Glu | Ser | His | Ser | Lys | Ala | Leu | Ser | Arg | His | Ala | Pro | Ser | Gln | Gly |
| | 770 | | | | | | 775 | | | | 780 | | | | |
| Thr | Glu | Leu | Pro | Gln | Ser | Asn | Arg | Asp | Asn | Ile | Arg | Thr | Ala | Lys | Ser |
| 785 | | | | | 790 | | | | | 795 | | | | | 800 |
| Asn | Gly | Ile | Ser | Leu | Pro | Tyr | Thr | Pro | Asn | Ser | Phe | Thr | Pro | Leu | Pro |
| | | | | 805 | | | | | 810 | | | | | 815 | |
| Gly | Ser | Ser | Leu | Tyr | Ile | Ile | Asn | Pro | Ala | Asn | Lys | Gly | Tyr | Leu | Val |

| | | | | | | | | | | | | | | | | | | |
|--|--|---|--|--|--|--|---|--|--|--|--|---|---|--|--|--|---|---|
| | | | 820 | | | | | 825 | | | | | | | | | 830 | |
| Glu Thr Asp Pro Arg Phe Ala Asn Tyr Arg Gln Trp Leu Gly Ser Asp 835 840 845 | Tyr Met Leu Gly Ser Leu Lys Leu Asp Pro Asn Asn Leu His Lys Arg 850 855 860 | Leu Gly Asp Gly Tyr Tyr Glu Gln Arg Leu Ile Asn Glu Gln Ile Ala 865 870 875 880 | Glu Leu Thr Gly His Arg Arg Leu Asp Gly Tyr Gln Asn Asp Glu Glu 885 890 895 | Gln Phe Lys Ala Leu Met Asp Asn Gly Ala Thr Ala Ala Arg Ser Met 900 905 910 | Asn Leu Ser Val Gly Ile Ala Leu Ser Ala Glu Gln Ala Ala Gln Leu 915 920 925 | Thr Ser Asp Ile Val Trp Leu Val Gln Lys Glu Val Lys Leu Pro Asp 930 935 940 | Gly Gly Thr Gln Thr Val Leu Met Pro Gln Val Tyr Val Arg Val Lys 945 950 955 960 | Asn Gly Gly Ile Asp Gly Lys Gly Ala Leu Leu Ser Gly Ser Asn Thr 965 970 975 | Gln Ile Asn Val Ser Gly Ser Leu Lys Asn Ser Gly Thr Ile Ala Gly 980 985 990 | Arg Asn Ala Leu Ile Ile Asn Thr Asp Thr Leu Asp Asn Ile Gly Gly 995 1000 1005 | Arg Ile His Ala Gln Lys Ser Ala Val Thr Ala Thr Gln Asp Ile Asn 1010 1015 1020 | Asn Ile Gly Gly Ile Leu Ser Ala Glu Gln Thr Leu Leu Leu Asn Ala 1025 1030 1035 1040 | Gly Asn Asn Ile Asn Asn Gln Ser Thr Ala Lys Ser Ser Gln Asn Ala 1045 1050 1055 | Gln Gly Ser Ser Thr Tyr Leu Asp Arg Met Ala Gly Ile Tyr Ile Thr 1060 1065 1070 | Gly Lys Glu Lys Gly Val Leu Ala Gln Ala Gly Lys Asp Ile Asn 1075 1080 1085 | Ile Ile Ala Gly Gln Ile Ser Asn Gln Ser Asp Gln Gly Gln Thr Arg 1090 1095 1100 | Leu Gln Ala Gly Arg Asp Ile Asn Leu Asp Thr Val Gln Thr Gly Lys 1105 1110 1115 1120 | Tyr Gln Glu Ile His Phe Asp Ala Asp Asn His Thr Ile Arg Gly Ser |

| 1125 | 1130 | 1135 |
|--|------|------|
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| Leu Ser Gly Asn Asn Leu Asn Ala Lys Ala Ala Glu Val Gly Ser Ala 1155 1160 1165 | | |
| Lys Gly Thr Leu Ala Val Tyr Ala Lys Asn Asp Ile Thr Ile Ser Ser 1170 1175 1180 | | |
| Gly Ile His Ala Gly Gln Val Asp Asp Ala Ser Lys His Thr Gly Arg 1185 1190 1195 1200 | | |
| Ser Gly Gly Gly Asn Lys Leu Val Ile Thr Asp Lys Ala Gln Ser His 1205 1210 1215 | | |
| His Glu Thr Ala Gln Ser Ser Thr Phe Glu Gly Lys Gln Val Val Leu 1220 1225 1230 | | |
| Gln Ala Gly Asn Asp Ala Asn Ile Leu Gly Ser Asn Val Ile Ser Asp 1235 1240 1245 | | |
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| Leu Met Ser Ala Gly Ile Gly Phe Thr Ile Gly Ser Lys Thr Asn Thr 1285 1290 1295 | | |
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| Ser Leu Lys Gly Asp Thr Thr Ile Val Ala Ser Lys His Tyr Glu Gln 1315 1320 1325 | | |
| Thr Gly Ser Asn Val Ser Ser Pro Glu Gly Asn Asn Leu Ile Ser Thr 1330 1335 1340 | | |
| Gln Ser Met Asp Ile Gly Ala Ala Gln Asn Gln Leu Asn Ser Lys Thr 1345 1350 1355 1360 | | |
| Thr Gln Thr Tyr Glu Gln Lys Gly Leu Thr Val Gly Ile Gln Phe Ala 1365 1370 1375 | | |
| Arg Tyr Arg Phe Gly Thr Thr Ser Asp Cys Arg Ser Thr Gln Ser Ser 1380 1385 1390 | | |
| Lys Gln Val Gly Gln Ser Lys Asn Asp Arg Val Asn Ala Met Ala Ala 1395 1400 1405 | | |
| Ala Asn Ala Gly Trp Gln Ala Tyr Gln Thr Gly Lys Gly Ala Gln Asn 1410 1415 1420 | | |
| Leu Ala Asn Gly Thr Thr Asn Ala Lys Gln Val Ser Ile Ser Ile Thr | | |

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| Ala Gln Ala Ser Gln Ile Gln Ala Gly Gly Lys Thr Thr Leu Tyr Cys | 1460 | 1465 | 1470 |
| Arg Arg Cys Gly Glu Gln Ser Asn Ile Asn Ile Thr Gly Ser Gly Val | 1475 | 1480 | 1485 |
| Ser Gly Arg Ala Gly Thr Gly Leu Ile Ala Asp Lys Gln Ile His Leu | 1490 | 1495 | 1500 |
| Gln Ser Ala Glu Gln Ser Asn Thr Glu Arg Ser Gln Asn Lys Ser Ala | 1505 | 1510 | 1515 |
| Gly Trp Asn Ala Gly Ala Ala Val Ser Phe Gly Gln Gly Gly Trp Ser | 1525 | 1530 | 1535 |
| Leu Gly Val Ala Ala Gly Gly Asn Val Gly Lys Gly Tyr Gly Tyr Gly | 1540 | 1545 | 1550 |
| Asp Ser Val Thr His Arg His Ser His Ile Gly Asp Lys Gly Ser Gln | 1555 | 1560 | 1565 |
| Thr Leu Ile Gln Ser Gly Gly Asp Thr Ile Ile Lys Gly Ala Gln Val | 1570 | 1575 | 1580 |
| Arg Gly Lys Gly Val Gln Val Asn Ala Lys Asn Leu Ser Ile Gln Ser | 1585 | 1590 | 1595 |
| Val Gln Asp Arg Glu Thr Tyr Gln Ser Lys Gln Gln Asn Ala Gly Ala | 1605 | 1610 | 1615 |
| Gln Val Thr Val Gly Tyr Gly Phe Ser Ala Ser Gly Asp Tyr Ser Gln | 1620 | 1625 | 1630 |
| Ser Lys Ile Arg Ala Asp His Ala Ser Val Thr Glu Gln Ser Gly Ile | 1635 | 1640 | 1645 |
| Tyr Ala Gly Glu Asp Gly Tyr Gln Ile Lys Val Gly Asn His Thr Gly | 1650 | 1655 | 1660 |
| Leu Lys Gly Gly Ile Ile Thr Ser Ser Gln Ser Ala Lys Asp Lys Gly | 1665 | 1670 | 1675 |
| Lys Asn Arg Phe Ser Thr Gly Thr Leu Ala Gly Ser Asp Ile Gln Asn | 1685 | 1690 | 1695 |
| Tyr Ser Gln Tyr Glu Gly Lys Ser Phe Gly Leu Gly Ala Ser Val Ala | 1700 | 1705 | 1710 |
| Val Ser Gly Lys Thr Leu Gly Gln Gly Ala Lys Asn Lys Pro Gln Asp | 1715 | 1720 | 1725 |
| Lys His Leu Thr Ser Ile Ala Asp Lys Asn Gly Ala Ser Ser Ser Val | | | |

| | | |
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| 1745 | 1750 | 1755 1760 |
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| | 1765 | 1770 1775 |
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| | 1780 | 1785 1790 |
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| | 1795 | 1800 1805 |
| Ile Phe Asp Lys Asp Arg Val Gln Ser Glu Leu Asp Leu Gln Arg Thr | | |
| | 1810 | 1815 1820 |
| Val Ser Gln Asp Phe Ser Lys Asn Val Gln Gln Thr Asn Thr Glu Ile | | |
| | 1825 | 1830 1835 1840 |
| Asn Gln His Leu Asp Lys Leu Lys Ala Asp Lys Glu Ala Ala Glu Thr | | |
| | 1845 | 1850 1855 |
| Ala Ala Ala Glu Ala Leu Ala Asn Gly Asp Met Glu Thr Ala Lys Arg | | |
| | 1860 | 1865 1870 |
| Lys Ala His Glu Ala Gln Asp Ala Ala Ala Lys Ala Asp Asn Trp Gln | | |
| | 1875 | 1880 1885 |
| Gln Gly Lys Val Ile Leu Asn Met Leu Ala Ser Gly Leu Ala Glu Pro | | |
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| Thr Gln Ser Gly Ala Gly Ile Ala Ala Ala Thr Ala Ser Pro Asp Val | | |
| | 1905 | 1910 1915 1920 |
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| | 1925 | 1930 1935 |
| Asn Gly Lys Leu Thr Ala Ser Gln Glu Thr Ala His Val Leu Ala His | | |
| | 1940 | 1945 1950 |
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| | 1955 | 1960 1965 |
| Ala Gly Ala Leu Gly Ala Gly Gly Ser Glu Ala Ala Ala Pro Ile Ile | | |
| | 1970 | 1975 1980 |
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| | 1985 | 1990 1995 2000 |
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| | 2005 | 2010 2015 |
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<212> DNA

<213> *Neisseria meningitidis*

<400> 1667

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Thr His Ala Pro Val Cys Arg Ser Asn Ile Phe Ser Phe Ser Leu Leu
    50              55              60

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Gly Phe Ser Leu Cys Leu Ala Val Gly Thr Ala Asn Ile Ala Phe Ala
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Asp Gly Ile Ile Ala Asp Lys Ala Ala Pro Lys Thr Gln Gln Ala Thr
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Thr Ser Ala Gly Val Ser Val Asn Gln Tyr Ala Gln Phe Asp Val Gly
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Gln Ala Lys Ser Leu Ser Asn Asn Gly Thr Leu Ala Ala Asp Asn Lys
 675 680 685

Leu Asp Ile Ala Leu Gln Asp Asp Phe Tyr Val Glu Arg Asn Ile Val
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His Thr Leu Gln Ala Gly Lys Arg Ile Arg Ile Lys Ala Asn Asn Leu
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| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| Asp | Asn | Ala | Ala | Gln | Gly | Asn | Ile | Gln | Ser | Gly | Gly | Thr | Thr | Asp | Ile | 740 | 745 | 750 |
| Gly | Thr | Gln | His | Asn | Leu | Thr | Asn | Arg | Gly | Leu | Ile | Asp | Gly | Gln | Gln | 755 | 760 | 765 |
| Thr | Lys | Ile | Gln | Ala | Gly | Gln | Met | Asn | Asn | Ile | Gly | Thr | Gly | Arg | Ile | 770 | 775 | 780 |
| Tyr | Gly | Asp | Asn | Ile | Ala | Ile | Ala | Ala | Thr | Arg | Leu | Asp | Asn | Gln | Asp | 785 | 790 | 795 |
| Glu | Asn | Gly | Thr | Gly | Ala | Ala | Ile | Ala | Ala | Arg | Glu | Asn | Leu | Asn | Leu | 805 | 810 | 815 |
| Gly | Ile | Gly | Gln | Leu | Asn | Asn | Arg | Glu | Asn | Ser | Leu | Ile | Tyr | Ser | Gly | 820 | 825 | 830 |
| Asn | Asp | Met | Ala | Val | Gly | Gly | Ala | Leu | Asp | Thr | Asn | Gly | Gln | Ala | Thr | 835 | 840 | 845 |
| Gly | Lys | Ala | Gln | Arg | Ile | His | Asn | Ala | Gly | Ala | Thr | Ile | Glu | Ala | Ala | 850 | 855 | 860 |
| Gly | Lys | Met | Arg | Leu | Gly | Val | Glu | Lys | Leu | His | Asn | Thr | Asn | Glu | His | 865 | 870 | 875 |
| Leu | Lys | Thr | Gln | Leu | Val | Glu | Thr | Gly | Arg | Glu | His | Ile | Val | Asp | Tyr | 885 | 890 | 895 |
| Glu | Ala | Phe | Gly | Arg | His | Glu | Leu | Leu | Arg | Glu | Gly | Thr | Gln | His | Glu | 900 | 905 | 910 |
| Leu | Gly | Trp | Ser | Val | Tyr | Asn | Asp | Glu | Ser | Asp | His | Leu | Arg | Thr | Pro | 915 | 920 | 925 |
| Asp | Gly | Ala | Ala | His | Glu | Asn | Trp | His | Lys | Tyr | Asp | Tyr | Glu | Lys | Val | 930 | 935 | 940 |
| Thr | Gln | Lys | Thr | Gln | Val | Thr | Gln | Thr | Ala | Pro | Ala | Lys | Ile | Ile | Ser | 945 | 950 | 955 |
| Gly | Asn | Asp | Leu | Thr | Ile | Asp | Gly | Lys | Glu | Val | Phe | Asn | Thr | Asp | Ser | 965 | 970 | 975 |
| Gln | Ile | Ile | Ala | Gly | Gly | Asn | Leu | Ile | Val | Gln | Thr | Glu | Lys | Asp | Gly | 980 | 985 | 990 |
| Leu | His | Asn | Glu | Gln | Thr | Phe | Gly | Glu | Lys | Lys | Val | Phe | Ser | Glu | Asn | 995 | 1000 | 1005 |
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| Thr | Gly | His | Ser | Glu | Gln | Asn | Tyr | Thr | Leu | Pro | Glu | Glu | Ile | Thr | Arg | 1025 | 1030 | 1035 |

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 Ser His His Ala Pro Ser Gln Gly Thr Glu Leu Pro Gln Ser Asn Gly
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 Ile Ser Leu Pro Tyr Thr Ser Asn Ser Phe Thr Pro Leu Pro Ser Ser
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 Leu Asp Ser Leu Lys Leu Asp Pro Asn Asn Leu His Lys Arg Leu Gly
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 Gly Gly Met Leu Ser Ala Glu Gln Thr Leu Leu Leu Asn Ala Gly Asn
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 Ser Ser Thr Tyr Leu Asp Arg Met Ala Gly Ile Tyr Ile Thr Gly Lys
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Glu Lys Gly Val Leu Ala Ala Gln Ala Gly Lys Asp Ile Asn Ile Ile
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Ala Thr His Phe Asp Ala Asp Asn His Val Ile Arg Gly Ser Thr Asn
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Gly Asn Asn Leu Asn Ala Lys Ala Ala Glu Val Ser Ser Ala Asn Gly
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Asn Thr Thr His Val Asp Asp Ala Ser Lys His Thr Gly Arg Ser Gly
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Gly Gly Asn Lys Leu Val Ile Thr Asp Lys Ala Gln Ser His His Glu
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Gln Ser Gln Ser Glu Thr Tyr His Gln Thr Gln Lys Ser Gly Leu Met
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Ser Ala Gly Ile Gly Phe Thr Ile Gly Ser Lys Thr Asn Thr Gln Glu
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Asn Gln Ser Gln Ser Asn Glu His Thr Gly Ser Thr Val Gly Ser Leu
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Lys Gly Asp Thr Thr Ile Val Ala Gly Lys His Tyr Glu Gln Ile Gly
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Ser Thr Val Ser Ser Pro Glu Gly Asn Asn Thr Ile Tyr Ala Gln Ser
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Ile Asp Ile Gln Ala Ala His Asn Lys Leu Asn Ser Asn Thr Thr Gln
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Thr Tyr Glu Gln Lys Gly Leu Thr Val Ala Phe Ser Ser Pro Val Thr
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Thr Ala Gly Gly Asn Val Gly Lys Gly Tyr Gly Asn Gly Asp Ser Ile
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Thr His Arg His Ser His Ile Gly Asp Lys Gly Ser Gln Thr Leu Ile
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Gln Ser Gly Gly Asp Thr Thr Ile Lys Gly Ala Gln Val Arg Gly Lys
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Val Gly Tyr Gly Phe Ser Ala Gly Gly Asp Tyr Ser Gln Ser Lys Ile
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 1905 1910 1915 1920

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Tyr Lys Gly Glu Ser Phe Gly Leu Gly Ala Ser Ala Ser Ile Ser Gly
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 2005 2010 2015

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Glu Ala Val Gln Ser Glu Leu Asp Leu Gln Arg Thr Val Ser Gln Asp
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Ala Gly Ile Ala Ala Ala Thr Ala Ser Pro Ala Val Ser Tyr Ala Ile
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Gly Gln His Phe Lys Asp Leu Ala Gly Gln Asn Ala Asn Gly Lys Leu
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| gatgtcatcg | gccatgcagg | tactgccctc | attgcccaga | accatatcag | actccaatct | 5760 |
| gccaaacagg | acggcagcga | gcaaagcaaa | aacaaaagca | gtggttgga | tgcaggcgta | 5820 |
| gccgtcaaaa | taggcaacgg | catcagggtt | ggaattaccg | ccggaggaaa | tatcggtaaa | 5880 |
| ggtaaagagc | aagggggaag | tactaccac | cgccacaccc | atgtcggcag | cacaaccggc | 5940 |
| aaaactacca | tccgaagcgg | cggggatacc | accctcaaag | gtgtgcagct | catcggaaca | 6000 |
| ggcatacagg | cagatacgcg | caacctgcat | atagaaagtg | ttcaagatac | tgaaacctat | 6060 |
| cagagcaaac | agcaaaacgg | caatgtccaa | gttactgtcg | gttacggatt | cagtgcagc | 6120 |
| ggcagttacc | gccaaagcaa | agtcaaaagca | gaccatgcct | ccgtaaccgg | gcaaaagcgg | 6180 |
| atztatgccc | gagaagacgg | ctatcaaatc | aaagtccag | acaacacaga | cctcaagggc | 6240 |
| ggatatcatc | cgtctagcca | aagcgcagaa | gataagggca | aaaacctttt | tcagacggcc | 6300 |
| acccttactg | ccagcgacat | tcaaaaccac | agccgctacg | aaggcagaag | cttcggcata | 6360 |
| ggcggcagtt | tcgacctgaa | cggcggtg | gacggcagcg | ttaccgacaa | acaaggcagg | 6420 |
| cctaccgaca | ggataagccc | ggcagccggc | tacggcagcg | acggagacag | caaaaacagc | 6480 |
| accaccgcga | gcggcgtcaa | caccacaac | atacacatca | ccgacgaagc | gggacaactt | 6540 |
| gcccgaacag | gcaggactgc | aaaagaaacc | gaagcgcgta | tctacaccgg | catcgacacc | 6600 |
| gaaactgccc | atcaaacctc | aggccatctg | aaaaacagct | tcgacaaaga | cgcggtcgcc | 6660 |
| aaagagatca | acctgcaaa | ggaagtaacg | aaggagttcg | gcagaaacgc | cgcccaagcc | 6720 |

```

gtagcggccg ttgccgacaa actcggcaat acccaaagtt acgaacggta tcaggaagcc 6780
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ggcagcctcg gcggcatact ggccggcggc ggcaattccc ttgccgcacc gtatttggac 7020
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gggaatatcc gtatccctgc aaacggcaat gttgcgaagg gggacaggat tccggatacg 7740
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<210> 1670

<211> 2599

<212> PRT

<213> Neisseria meningitidis

<400> 1670

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Met Asn Arg Thr Leu Tyr Lys Val Val Phe Asn Lys His Arg Asn Cys
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```

```

Met Ile Ala Val Ala Glu Asn Ala Lys Arg Glu Gly Lys Asn Thr Ala
      20             25             30

```

```

Asp Thr Gln Ala Val Gly Ile Leu Pro Asn Asp Ile Ala Gly Phe Ala
      35             40             45

```

```

Gly Phe Ile His Ser Ile Ser Val Ile Ser Phe Ser Leu Ser Leu Leu
      50             55             60

```

```

Leu Gly Ser Ala Leu Ile Leu Thr Ser Ser Ser Ala Thr Ala Gln Gly
      65             70             75             80

```

```

Ile Val Ala Asp Lys Ser Ala Pro Ala Gln Gln Gln Pro Thr Ile Leu
      85             90             95

```

```

Gln Thr Gly Asn Gly Ile Pro Gln Val Asn Ile Gln Thr Pro Thr Ser
     100             105             110

```

```

Ala Gly Val Ser Val Asn Gln Tyr Ala Gln Phe Asp Val Gly Asn Arg
     115             120             125

```

```

Gly Ala Ile Leu Asn Asn Ser Arg Ser Asn Thr Gln Thr Gln Leu Gly
     130             135             140

```

```

Gly Trp Ile Gln Gly Asn Pro Trp Leu Ala Arg Gly Glu Ala Arg Val
     145             150             155             160

```

```

Val Val Asn Gln Ile Asn Ser Ser His Ser Ser Gln Leu Asn Gly Tyr

```

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | 165 | | | | 170 | | | | | 175 | | |
| Ile | Glu | Val | Gly | Gly | Arg | Arg | Ala | Glu | Val | Val | Ile | Ala | Asn | Pro | Ala |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Gly | Ile | Ala | Val | Asn | Gly | Gly | Gly | Phe | Ile | Asn | Ala | Ser | Arg | Ala | Thr |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Leu | Thr | Thr | Ala | Gln | Pro | Gln | Tyr | Gln | Ala | Gly | Asp | Leu | Ser | Gly | Phe |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Lys | Ile | Arg | Gln | Gly | Asn | Val | Val | Ile | Ala | Gly | His | Gly | Leu | Asp | Ala |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Arg | Asp | Thr | Asp | Tyr | Thr | Arg | Ile | Leu | Ser | Tyr | His | Ser | Lys | Ile | Asp |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Ala | Pro | Val | Trp | Gly | Gln | Asp | Val | Arg | Val | Val | Ala | Gly | Gln | Asn | Asp |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Val | Ala | Ala | Thr | Gly | Asp | Ala | His | Ser | Pro | Ile | Leu | Asn | Asn | Ala | Ala |
| | | | 275 | | | | 280 | | | | | 285 | | | |
| Ala | Asn | Thr | Ser | Asn | Asn | Thr | Ala | Asn | Asn | Gly | Thr | His | Ile | Pro | Leu |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Phe | Ala | Ile | Asp | Thr | Gly | Lys | Leu | Gly | Gly | Met | Tyr | Ala | Asn | Lys | Ile |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Thr | Leu | Ile | Ser | Thr | Val | Glu | Gln | Ala | Gly | Ile | Arg | Asn | Gln | Gly | Gln |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Trp | Phe | Ala | Ser | Ala | Gly | Asn | Val | Ala | Val | Asn | Ala | Glu | Gly | Lys | Leu |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Val | Asn | Thr | Gly | Met | Ile | Ala | Ala | Thr | Gly | Glu | Asn | His | Ala | Val | Ser |
| | | | 355 | | | | 360 | | | | | 365 | | | |
| Leu | His | Ala | Arg | Asn | Val | His | Asn | Ser | Gly | Thr | Val | Ala | Ser | Gln | Asp |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Asp | Ala | Asn | Ile | His | Ser | Gln | Thr | Leu | Asp | Asn | Ser | Gly | Thr | Val | Leu |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Ser | Ser | Gly | Arg | Leu | Thr | Val | Arg | Asn | Leu | Gly | Arg | Leu | Lys | Asn | Gln |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| Asn | Asn | Gly | Thr | Ile | Gln | Ala | Ala | Arg | Leu | Asp | Met | Ser | Thr | Gly | Gly |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Leu | Asp | Asn | Thr | Gly | Asn | Ile | Thr | Gln | Thr | Gly | Ser | Gln | Ala | Leu | Asp |
| | | 435 | | | | | 440 | | | | | 445 | | | |
| Leu | Val | Ser | Ala | Gly | Lys | Phe | Asp | Asn | Ser | Gly | Lys | Ile | Gly | Val | Ser |
| | 450 | | | | | 455 | | | | | 460 | | | | |
| Asp | Val | Pro | Gln | Thr | Gly | Leu | Asn | Pro | Asn | Pro | Ser | Val | Ile | Pro | Gln |

| | | | | | | |
|---|-----|-----|--|-----|--|-----|
| 465 | | 470 | | 475 | | 480 |
| Ile Pro Ser Thr Ala Thr Gly Ser Gly Ser Ser Thr Val Ser Val Ser | | | | | | |
| | 485 | | | 490 | | 495 |
| Lys Pro Gly Ser Asn Asn Pro Val Ser Pro Thr Ala Pro Ala Lys Asn | | | | | | |
| | 500 | | | 505 | | 510 |
| Tyr Ala Val Gly Arg Ile Gln Thr Thr Gly Ala Phe Asp Asn Ala Gly | | | | | | |
| | 515 | | | 520 | | 525 |
| Ser Ile Asn Ala Gly Gly Gln Ile Asp Ile Ala Ala Gln Asn Gly Leu | | | | | | |
| | 530 | | | 535 | | 540 |
| Gly Asn Ser Gly Ser Leu Asn Ala Ala Lys Leu Arg Val Ser Gly Asp | | | | | | |
| | 545 | | | 550 | | 555 |
| Ser Phe Asn Asn Thr Val Lys Gly Lys Leu Gln Ala His Asp Leu Ala | | | | | | |
| | 565 | | | 570 | | 575 |
| Val Asn Thr Gln Thr Ala Lys Asn Ser Gly His Leu Leu Thr Gln Thr | | | | | | |
| | 580 | | | 585 | | 590 |
| Gly Lys Ile Asp Asn Arg Glu Leu His Asn Ala Gly Glu Ile Ala Ala | | | | | | |
| | 595 | | | 600 | | 605 |
| Asn Asn Leu Thr Leu Ile His Ser Gly Arg Leu Ser Asn Asp Lys Lys | | | | | | |
| | 610 | | | 615 | | 620 |
| Gly Asn Ile Arg Ala Ala His Leu Gln Leu Asp Thr Ala Gly Leu His | | | | | | |
| | 625 | | | 630 | | 635 |
| Asn Ala Gly Asn Ile Leu Ala Asp Ser Gly Thr Val Thr Thr Lys Asn | | | | | | |
| | 645 | | | 650 | | 655 |
| Asn Leu Arg Asn Thr Gly Lys Val Ser Val Ala Arg Leu Asn Thr Glu | | | | | | |
| | 660 | | | 665 | | 670 |
| Gly Gln Thr Leu Asp Asn Thr Arg Gly Arg Ile Glu Ala Glu Thr Val | | | | | | |
| | 675 | | | 680 | | 685 |
| Asn Ile Gln Ser Gln Gln Leu Thr Asn Gln Ser Gly His Ile Thr Ala | | | | | | |
| | 690 | | | 695 | | 700 |
| Thr Glu Gln Leu Thr Ile Asn Ser Arg Asn Val Asp Asn Gln Asn Gly | | | | | | |
| | 705 | | | 710 | | 715 |
| Lys Leu Leu Ser Ala Asn Gln Ala Gln Leu Ala Val Ser Asp Gly Leu | | | | | | |
| | 725 | | | 730 | | 735 |
| Tyr Asn Gln His Gly Glu Ile Ala Thr Asn Arg Gln Leu Ser Ile His | | | | | | |
| | 740 | | | 745 | | 750 |
| Asp Lys Asn Gln Asn Thr Leu Ala Leu Asn Asn Ala Asp Gly Thr Ile | | | | | | |
| | 755 | | | 760 | | 765 |
| Gln Ser Ala Gly Asn Val Ser Leu Gln Ala Lys Ser Leu Ala Asn Asn | | | | | | |

| 770 | | | | | 775 | | | | | 780 | | | | |
|---------------------|---------------------|-----------------------------|------|------|-----|--|--|--|--|-----|--|--|--|--|
| Gly Thr Leu Thr Ala | Gly Asn Lys Leu Asp | Ile Ala Leu Thr Asp | Asp | | | | | | | | | | | |
| 785 | 790 | 795 | 800 | | | | | | | | | | | |
| Phe Val Val Glu Arg | Asp Leu Thr Ala Gly | Lys Gln Leu Asn Leu Ser | | | | | | | | | | | | |
| | 805 | 810 | 815 | | | | | | | | | | | |
| Ile Lys Gly Arg Leu | Lys Asn Thr His Thr | Leu Gln Ala Gly His Thr | | | | | | | | | | | | |
| | 820 | 825 | 830 | | | | | | | | | | | |
| Leu Lys Leu Asn Ala | Gly Asn Ile Asp Asn | Gln Val Thr Gly Lys Ile | | | | | | | | | | | | |
| | 835 | 840 | 845 | | | | | | | | | | | |
| Ile Gly Gly Glu Gln | Thr Asp Ile Thr Ser | Glu Gln His Val Asp Asn | | | | | | | | | | | | |
| | 850 | 855 | 860 | | | | | | | | | | | |
| Arg Gly Leu Ile Asn | Ser Asp Gly Leu Thr | His Ile Gly Ala Gly Gln | | | | | | | | | | | | |
| 865 | 870 | 875 | 880 | | | | | | | | | | | |
| Thr Leu Thr Asn Thr | Gly Thr Gly Lys Ile | Tyr Gly Asn His Ile Ala | | | | | | | | | | | | |
| | 885 | 890 | 895 | | | | | | | | | | | |
| Leu Asp Ala Gln Ile | Leu Leu Asn Arg | Glu Glu Thr Thr Glu Gly Ser | | | | | | | | | | | | |
| | 900 | 905 | 910 | | | | | | | | | | | |
| Thr Lys Ala Gly Ala | Ile Ala Ala Arg | Lys Arg Leu Asp Ile Gly Ala | | | | | | | | | | | | |
| | 915 | 920 | 925 | | | | | | | | | | | |
| Lys Glu Ile His Asn | Gln Glu Gly Ala Leu | Leu Ser Ser Glu Gly Ile | | | | | | | | | | | | |
| | 930 | 935 | 940 | | | | | | | | | | | |
| Phe Ala Val Gly Asn | Arg Leu Asp Glu Gln | His His Ala Ala Gly Met | | | | | | | | | | | | |
| 945 | 950 | 955 | 960 | | | | | | | | | | | |
| Ala Asp Thr Phe Val | Asn Gly Ser Ala Gly | Leu Glu Val Gln Gly Asp | | | | | | | | | | | | |
| | 965 | 970 | 975 | | | | | | | | | | | |
| Ala Leu Met Ser Val | Arg Asn Met Gln Asn | Ile Asn Asn His Phe Lys | | | | | | | | | | | | |
| | 980 | 985 | 990 | | | | | | | | | | | |
| Thr Glu Thr Tyr Leu | Ala Lys Ala Glu Lys | Gln Val Arg Asp Tyr Thr | | | | | | | | | | | | |
| | 995 | 1000 | 1005 | | | | | | | | | | | |
| Val Leu Gly Gln Asn | Thr Tyr Tyr Gln Ala | Gly Lys Asp Gly Leu Phe | | | | | | | | | | | | |
| | 1010 | 1015 | 1020 | | | | | | | | | | | |
| Asp Asn Ser Gln Gly | Gln Lys Asp Gln Thr | Thr Ala Thr Phe His Leu | | | | | | | | | | | | |
| | 1025 | 1030 | 1035 | 1040 | | | | | | | | | | |
| Lys Asn Gly Ser Arg | Ile Glu Ala Asn Gln | Trp His Val Arg Asp Tyr | | | | | | | | | | | | |
| | 1045 | 1050 | 1055 | | | | | | | | | | | |
| His Ile Glu Thr Tyr | Lys Glu Arg Ile Ile | Glu Asn Arg Pro Ala His | | | | | | | | | | | | |
| | 1060 | 1065 | 1070 | | | | | | | | | | | |
| Ile Thr Val Gly Gly | Asp Leu Thr Ala Ser | Gly Gln Asn Trp Leu Asn | | | | | | | | | | | | |

| 1075 | 1080 | 1085 |
|--|------|------|
| Lys Asp Ser Arg Ile Val Val Gly Gly Arg Ile Ile Thr Asp Asp Leu 1090 1095 1100 | | |
| Asn Gln Lys Glu Ile Thr Asn Gln Ser Thr Thr Gly Lys Gly Arg Thr 1105 1110 1115 1120 | | |
| Asp Ala Val Gly Thr Gln Trp Asp Ser Val Thr Lys Lys Gly Trp Tyr 1125 1130 1135 | | |
| Ser Gly Arg Lys Arg Gln Arg Arg Thr Glu Arg Asn His Thr Pro Tyr 1140 1145 1150 | | |
| His Asp Thr Gln Leu Phe Thr His Asp Phe Asp Thr Pro Val Ser Val 1155 1160 1165 | | |
| Ile Gln Gln Asn Ala Ala Ser Pro Ser Phe Gln Pro Ala Ala Ser Ala 1170 1175 1180 | | |
| Ile Lys Leu Ile Asp Gly Val Ser Thr Ala Ala Val Asn Gly Gln Arg 1185 1190 1195 1200 | | |
| Ile His Thr Gly Asn Val Val Ser Leu Asn Asn Ala Thr Val Thr Leu 1205 1210 1215 | | |
| Pro Asn Ser Ser Leu Tyr Thr Thr His Pro Asp Asn Lys Gly Trp Leu 1220 1225 1230 | | |
| Val Glu Thr Asp Pro Gln Phe Ala Asp Tyr Arg Arg Trp Leu Gly Ser 1235 1240 1245 | | |
| Asp Tyr Met Leu Gln Gln Leu Gln Leu Asp Thr Asn His Leu His Lys 1250 1255 1260 | | |
| Arg Leu Gly Asp Gly Tyr Tyr Glu Gln Lys Leu Val Asn Glu Gln Ile 1265 1270 1275 1280 | | |
| His Gln Leu Thr Gly Tyr Arg Arg Leu Asp Gly Tyr Arg Ser Asp Glu 1285 1290 1295 | | |
| Glu Gln Phe Lys Ala Leu Met Asp Asn Gly Leu Thr Ala Ala Lys Thr 1300 1305 1310 | | |
| Phe Gly Leu Thr Pro Gly Ile Ala Leu Ser Ala Glu Gln Val Ala Arg 1315 1320 1325 | | |
| Leu Thr Ser Asp Ile Val Trp Met Glu Asn Gln Thr Val Thr Leu Ser 1330 1335 1340 | | |
| Asp Gly Ser Thr Gln Thr Val Leu Val Pro Lys Val Tyr Ala Leu Ala 1345 1350 1355 1360 | | |
| Arg Lys Gly Asp Leu Asn Thr Ser Gly Gly Leu Ile Ser Ala Glu Gln 1365 1370 1375 | | |
| Val Leu Leu Lys Leu Gln Asn Gly Asn Leu Thr Asn Ser Gly Thr Ile | | |

| 1380 | 1385 | 1390 |
|--|------|------|
| Ala Gly Arg Gln Ala Val Leu Ile Gln Ala Arg Asn Ile Asn Ser Asn 1395 1400 1405 | | |
| Gly Asn Ile Gln Ala Asp Gln Ile Gly Leu Lys Ala Glu Lys Ser Ile 1410 1415 1420 | | |
| Asn Ile Asp Gly Gly Gln Val Gln Ala Gly Arg Leu Leu Thr Ala Gln 1425 1430 1435 1440 | | |
| Ala Gln Asn Ile Asn Leu Asn Gly Thr Thr Gln Thr Ser Gly Asn Glu 1445 1450 1455 | | |
| Arg Asn Gly Asn Thr Ala Ile Asp Arg Met Ala Gly Ile Asn Val Val 1460 1465 1470 | | |
| Gly Ser His Thr Glu Gln Val Asp Asn Arg Thr Ser Asp Gly Ile Leu 1475 1480 1485 | | |
| Ser Leu His Ala Ser Asn Asp Ile Asn Leu Asn Ala Ala Thr Val Ser 1490 1495 1500 | | |
| Asn Gln Val Lys Asp Gly Thr Thr Gln Ile Thr Ala Gly Asn Asn Leu 1505 1510 1515 1520 | | |
| Asn Leu Gly Thr Ile Arg Thr Glu His Arg Glu Ala Tyr Gly Thr Leu 1525 1530 1535 | | |
| Asp Asp Glu Asn His Arg His Val Arg Gln Ser Thr Glu Val Gly Ser 1540 1545 1550 | | |
| Ser Ile Arg Thr Gln Asn Gly Ala Leu Leu Arg Ala Gly Asn Asp Leu 1555 1560 1565 | | |
| Lys Ile Arg Gln Gly Glu Leu Glu Ala Glu Glu Gly Lys Thr Val Leu 1570 1575 1580 | | |
| Ala Ala Gly Arg Asp Val Thr Ile Ser Glu Gly Arg Gln Ile Thr Glu 1585 1590 1595 1600 | | |
| Leu Asp Thr Ser Val Ser Gly Lys Ser Lys Gly Ile Leu Ser Ser Thr 1605 1610 1615 | | |
| Lys Thr His Asp Arg Tyr Arg Phe Ser His Asp Glu Ala Val Gly Ser 1620 1625 1630 | | |
| Asn Ile Gly Gly Gly Lys Met Ile Val Ala Ala Gly Gln Asp Ile Asn 1635 1640 1645 | | |
| Val Arg Gly Ser Asn Leu Ile Ser Asp Lys Gly Ile Val Leu Lys Ala 1650 1655 1660 | | |
| Gly His Asp Ile Asp Ile Ser Thr Ala His Asn Arg Tyr Thr Gly Asn 1665 1670 1675 1680 | | |
| Glu Tyr His Glu Ser Lys Lys Ser Gly Val Met Gly Thr Gly Gly Leu | | |

| 1685 | 1690 | 1695 |
|--|------|------|
| Gly Phe Thr Ile Gly Asn Arg Lys Thr Thr Asp Asp Thr Asp Arg Thr 1700 1705 1710 | | |
| Asn Ile Val His Thr Gly Ser Ile Ile Gly Ser Leu Asn Gly Asp Thr 1715 1720 1725 | | |
| Val Thr Val Ala Gly Asn Arg Tyr Arg Gln Thr Gly Ser Thr Val Ser 1730 1735 1740 | | |
| Ser Pro Glu Gly Arg Asn Thr Val Thr Ala Lys Ser Ile Asp Val Glu 1745 1750 1755 1760 | | |
| Phe Ala Asn Asn Arg Tyr Ala Thr Asp Tyr Ala His Thr Gln Glu Gln 1765 1770 1775 | | |
| Lys Gly Leu Thr Val Ala Leu Asn Val Pro Val Val Gln Ala Ala Gln 1780 1785 1790 | | |
| Asn Phe Ile Gln Ala Ala Gln Asn Val Gly Lys Ser Lys Asn Lys Arg 1795 1800 1805 | | |
| Val Asn Ala Met Ala Ala Ala Asn Ala Ala Trp Gln Ser Tyr Gln Ala 1810 1815 1820 | | |
| Thr Gln Gln Met Gln Gln Phe Ala Pro Ser Ser Ser Ala Gly Gln Gly 1825 1830 1835 1840 | | |
| Gln Asn Asn Asn Gln Ser Pro Ser Ile Ser Val Ser Ile Thr Tyr Gly 1845 1850 1855 | | |
| Glu Gln Lys Ser Arg Asn Glu Gln Lys Arg His Tyr Thr Glu Ala Ala 1860 1865 1870 | | |
| Ala Ser Gln Ile Ile Gly Lys Gly Gln Thr Thr Leu Ala Ala Thr Gly 1875 1880 1885 | | |
| Ser Gly Glu Gln Ser Asn Ile Asn Ile Thr Gly Ser Asp Val Ile Gly 1890 1895 1900 | | |
| His Ala Gly Thr Ala Leu Ile Ala Asp Asn His Ile Arg Leu Gln Ser 1905 1910 1915 1920 | | |
| Ala Lys Gln Asp Gly Ser Glu Gln Ser Lys Asn Lys Ser Ser Gly Trp 1925 1930 1935 | | |
| Asn Ala Gly Val Ala Val Lys Ile Gly Asn Gly Ile Arg Phe Gly Ile 1940 1945 1950 | | |
| Thr Ala Gly Gly Asn Ile Gly Lys Gly Lys Glu Gln Gly Gly Ser Thr 1955 1960 1965 | | |
| Thr His Arg His Thr His Val Gly Ser Thr Thr Gly Lys Thr Thr Ile 1970 1975 1980 | | |
| Arg Ser Gly Gly Asp Thr Thr Leu Lys Gly Val Gln Leu Ile Gly Lys | | |

| 1985 | 1990 | 1995 | 2000 |
|---|------|------|------|
| Gly Ile Gln Ala Asp Thr Arg Asn Leu His Ile Glu Ser Val Gln Asp | 2005 | 2010 | 2015 |
| Thr Glu Thr Tyr Gln Ser Lys Gln Gln Asn Gly Asn Val Gln Val Thr | 2020 | 2025 | 2030 |
| Val Gly Tyr Gly Phe Ser Ala Ser Gly Ser Tyr Arg Gln Ser Lys Val | 2035 | 2040 | 2045 |
| Lys Ala Asp His Ala Ser Val Thr Gly Gln Ser Gly Ile Tyr Ala Gly | 2050 | 2055 | 2060 |
| Glu Asp Gly Tyr Gln Ile Lys Val Arg Asp Asn Thr Asp Leu Lys Gly | 2065 | 2070 | 2075 |
| Gly Ile Ile Thr Ser Ser Gln Ser Ala Glu Asp Lys Gly Lys Asn Leu | 2085 | 2090 | 2095 |
| Phe Gln Thr Ala Thr Leu Thr Ala Ser Asp Ile Gln Asn His Ser Arg | 2100 | 2105 | 2110 |
| Tyr Glu Gly Arg Ser Phe Gly Ile Gly Gly Ser Phe Asp Leu Asn Gly | 2115 | 2120 | 2125 |
| Gly Trp Asp Gly Thr Val Thr Asp Lys Gln Gly Arg Pro Thr Asp Arg | 2130 | 2135 | 2140 |
| Ile Ser Pro Ala Ala Gly Tyr Gly Ser Asp Gly Asp Ser Lys Asn Ser | 2145 | 2150 | 2155 |
| Thr Thr Arg Ser Gly Val Asn Thr His Asn Ile His Ile Thr Asp Glu | 2165 | 2170 | 2175 |
| Ala Gly Gln Leu Ala Arg Thr Gly Arg Thr Ala Lys Glu Thr Glu Ala | 2180 | 2185 | 2190 |
| Arg Ile Tyr Thr Gly Ile Asp Thr Glu Thr Ala Asp Gln His Ser Gly | 2195 | 2200 | 2205 |
| His Leu Lys Asn Ser Phe Asp Lys Asp Ala Val Ala Lys Glu Ile Asn | 2210 | 2215 | 2220 |
| Leu Gln Arg Glu Val Thr Lys Glu Phe Gly Arg Asn Ala Ala Gln Ala | 2225 | 2230 | 2235 |
| Val Ala Ala Val Ala Asp Lys Leu Gly Asn Thr Gln Ser Tyr Glu Arg | 2245 | 2250 | 2255 |
| Tyr Gln Glu Ala Arg Thr Leu Leu Glu Ala Glu Leu Gln Asn Thr Asp | 2260 | 2265 | 2270 |
| Ser Glu Ala Glu Lys Ala Ala Phe Arg Ala Ser Leu Gly Gln Val Asn | 2275 | 2280 | 2285 |
| Ala Tyr Leu Ala Glu Asn Gln Ser Arg Tyr Asp Thr Trp Lys Glu Gly | | | |

[illegible]

2595

<210> 1671
<211> 327
<212> DNA
<213> *Neisseria gonorrhoeae*

<400> 1671
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aacgacaccg gtcgcctgc acttctggct acctgcacgc gtgcgatgtc caagtcgagc 180
gcgaaatacg gaatatcctc tttgggcgaa gacgcgtccg accgtctgcc cgcccctgcc 240
gaagccgaca atcagcacat gatcagactt gtcacatcgt tccaccaaca tgctgtgcag 300
atcgagcgac ttcatgtccc agcttga 327

<210> 1672
<211> 108
<212> PRT
<213> *Neisseria gonorrhoeae*

<400> 1672
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Ser Val Thr Thr Thr Ile Phe Ala Arg Pro Arg Pro Ala Ala Ser Asn
20 25 30
Thr Ser Leu Arg Phe Ala Ser Pro Asn Asp Thr Gly Ser Pro Ala Leu
35 40 45
Leu Ala Thr Cys Thr Arg Ala Met Ser Lys Ser Ser Ala Lys Tyr Gly
50 55 60
Ile Ser Ser Leu Gly Glu Asp Ala Ser Asp Arg Leu Pro Ala Pro Ala
65 70 75 80
Glu Ala Asp Asn Gln His Met Ile Arg Leu Ala His Arg Phe His Gln
85 90 95
His Ala Val Gln Ile Glu Arg Leu His Val Pro Ala
100 105

<210> 1673
<211> 630
<212> DNA
<213> *Neisseria meningitidis*

<400> 1673
atggacagca cattgtctaa aacgtgttgc gtttcgtgca tattgttgag cgtaaccacc 60
accatttttcg cccgtcccag accggcggct tccaatactt ccctgcgttt cgcacgcgcg 120
aacgacaccg gttcgcccgc acttctggca acctgcaccc gcgcaatgtc caagtcgagc 180
gcgaaatacg gaatatcctc ttgggcaagg acgcgtccga ccgtctgccc gcccctgccg 240
aagccgacaa tcagcacatg gtcggacttg ctcatggttt ctaccagcat actgtgcaga 300
tcgagcgact tcatgtccca gcttgacttg accaaacgcc cgaccagcgc atcgctgccg 360

```

cccaagagga agggcgcgat aatcatcgac agcagaaccg ccgccgctgc cgctgttcc 420
cattctggcg aaaccatata aagctgcccg gcaatggcca gcatcacgaa gccgaactcg 480
ccgccctgcg cgagatacaa agccgttttg aggctgtcgc cgaccgaatg tttcattttg 540
aaggcaatgg caaacacaac cagtgccttc aacaccagca gcattgccaa cagcatcaat 600
acctgccgcc agccgccgat caatgcctga 630

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<210> 1674

<211> 209

<212> PRT

<213> Neisseria meningitidis

<400> 1674

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Met Asp Ser Thr Leu Ser Lys Thr Cys Cys Val Ser Cys Ile Leu Leu
  1              5              10              15

Ser Val Thr Thr Thr Ile Phe Ala Arg Pro Arg Pro Ala Ala Ser Asn
          20              25              30

Thr Ser Leu Arg Phe Ala Ser Pro Asn Asp Thr Gly Ser Pro Ala Leu
      35              40              45

Leu Ala Thr Cys Thr Arg Ala Met Ser Lys Ser Ser Ala Lys Tyr Gly
      50              55              60

Ile Ser Ser Trp Ala Arg Thr Arg Pro Thr Val Cys Pro Pro Leu Pro
      65              70              75              80

Lys Pro Thr Ile Ser Thr Trp Ser Asp Leu Leu Met Val Ser Thr Ser
          85              90              95

Ile Leu Cys Arg Ser Ser Asp Phe Met Ser Gln Leu Asp Leu Thr Lys
      100              105              110

Arg Pro Thr Ser Ala Ser Leu Pro Pro Lys Arg Lys Gly Ala Ile Ile
      115              120              125

Ile Asp Ser Arg Thr Ala Ala Val Ala Ala Cys Ser His Ser Gly Glu
      130              135              140

Thr Ile Ser Ser Cys Pro Ala Met Ala Ser Ile Thr Lys Pro Asn Ser
      145              150              155              160

Pro Pro Cys Ala Arg Tyr Lys Ala Val Leu Arg Leu Ser Pro Thr Glu
          165              170              175

Cys Phe Ile Leu Lys Ala Met Ala Asn Thr Thr Ser Ala Phe Asn Thr
      180              185              190

Ser Ser Ile Ala Asn Ser Ile Asn Thr Cys Arg Gln Pro Pro Ile Asn
      195              200              205

```

Ala

<210> 1675

<211> 630

<212> DNA

<213> *Neisseria meningitidis*

<400> 1675

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atggacagca cattgtctaa aacgtgttgc gtttcgtgca tattgttgag cgtaaccacc 60
accattttcg cccgtcccag accggcggct tccaatactt ccctgcgttt cgcacgcgcc 120
aacgacaccg gttcgcccgc acttctggca acctgcaccc gcgcaatgtc caagtcgagc 180
gcgaaatacg gaatatcctc ttgggcaagg acgcgtccga ccgtctgccc gccctgccg 240
aagccgacaa tcagcacatg gtcggacttg ctcatggttt ctaccagcat actgtgcaga 300
tcgagcgact tcatgtccca gcttgacttg accaaacgcc cgaccagtgc atcgctgccg 360
cccaagagga agggcgcgat aatcatcgac agcagaaccg ccgccgtcgc cgcctgttcc 420
cattctagcg aaaccatata aagctgcccg gcaatggcca gcatcacgaa gccgaactcg 480
ccgccctgcg cgagatacaa agccgttttg aggctgtcgc cgaccgaatg tttcattttg 540
aaggcaatgg caaacacaac cagtgccttc aacaccagca gcattgcca cagcatcaat 600
acctgccgcc agccgccgat taatgcctga 630
```

<210> 1676

<211> 209

<212> PRT

<213> *Neisseria meningitidis*

<400> 1676

```
Met Asp Ser Thr Leu Ser Lys Thr Cys Cys Val Ser Cys Ile Leu Leu
 1              5              10              15

Ser Val Thr Thr Thr Ile Phe Ala Arg Pro Arg Pro Ala Ala Ser Asn
      20              25              30

Thr Ser Leu Arg Phe Ala Ser Pro Asn Asp Thr Gly Ser Pro Ala Leu
      35              40              45

Leu Ala Thr Cys Thr Arg Ala Met Ser Lys Ser Ser Ala Lys Tyr Gly
      50              55              60

Ile Ser Ser Trp Ala Arg Thr Arg Pro Thr Val Cys Pro Pro Leu Pro
      65              70              75              80

Lys Pro Thr Ile Ser Thr Trp Ser Asp Leu Leu Met Val Ser Thr Ser
      85              90              95

Ile Leu Cys Arg Ser Ser Asp Phe Met Ser Gln Leu Asp Leu Thr Lys
      100             105             110

Arg Pro Thr Ser Ala Ser Leu Pro Pro Lys Arg Lys Gly Ala Ile Ile
      115             120             125

Ile Asp Ser Arg Thr Ala Ala Val Ala Ala Cys Ser His Ser Ser Glu
      130             135             140

Thr Ile Ser Ser Cys Pro Ala Met Ala Ser Ile Thr Lys Pro Asn Ser
      145             150             155             160

Pro Pro Cys Ala Arg Tyr Lys Ala Val Leu Arg Leu Ser Pro Thr Glu
      165             170             175
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Cys Phe Ile Leu Lys Ala Met Ala Asn Thr Thr Ser Ala Phe Asn Thr
180 185 190

Ser Ser Ile Ala Asn Ser Ile Asn Thr Cys Arg Gln Pro Pro Ile Asn
195 200 205

Ala

<210> 1677

<211> 351

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1677

atgccgtctg aacaatatct tttcagacgg cattttgtat ggggggtaac gggtgttcag 60
cccaggtacg tcctgcatat cgtacaaacc cgttttgccg ttaccctaaa ctgcggcgcg 120
gacggcaccg gcggcaaagg tcatgcggct gccggctttg tgggtgattt ccacgcgttc 180
gccgtcggtg gcgaagaggg cgggtgtggtc gccgactatg tcgcctgcgc ggacgggtggc 240
aaagccgatg gtggaaggat cgcgcggacc agtgtggcct tcgcggcgct aaacggcgca 300
ttgtttgagg tcgcggccga gcgcgccggc gatgacttcg cccattcgta a 351

<210> 1678

<211> 116

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1678

Met Pro Ser Glu Gln Tyr Leu Phe Arg Arg His Phe Val Trp Gly Leu
1 5 10 15

Thr Val Val Gln Pro Glu Tyr Val Leu His Ile Val Gln Thr Arg Phe
20 25 30

Ala Val Tyr Pro Asn Cys Gly Ala Asp Gly Thr Gly Gly Lys Gly His
35 40 45

Ala Ala Ala Gly Phe Val Gly Asp Phe His Ala Phe Ala Val Gly Gly
50 55 60

Glu Glu Gly Gly Val Val Ala Asp Tyr Val Ala Cys Ala Asp Gly Gly
65 70 75 80

Lys Ala Asp Gly Gly Arg Ile Ala Arg Thr Ser Val Ala Phe Ala Ala
85 90 95

Val Asn Gly Ala Leu Phe Glu Val Ala Ala Glu Arg Ala Gly Asp Asp
100 105 110

Phe Ala His Ser
115

<210> 1679

<211> 351
<212> DNA
<213> *Neisseria meningitidis*

<400> 1679
atgccgtctg aacaatatct tttcagacgg cattttgtat ggggggtaac gggtgttcag 60
cccgagtacg tcctgcatat cgtacaaacc cgttttgccg ttgacccaaa ctgcggcgcg 120
gacggcaccg gcggcaaagg tcatgcggct gctggccttg tgggtgattt ccacgcgctc 180
gccgtcggtg gcgaagaggg cgggtgtggtc gccgacgatg tcgcctgcgc ggacggtggc 240
aaagccgatg gtcgacggat cgcgcggacc ggtgtggcct tcgcggccgt aaacggcgca 300
ttgtttgagg tctctgccga gcgcgccggc gatgacttcg cccatgcgta a 351

<210> 1680
<211> 116
<212> PRT
<213> *Neisseria meningitidis*

<400> 1680
Met Pro Ser Glu Gln Tyr Leu Phe Arg Arg His Phe Val Trp Gly Leu
1 5 10 15
Thr Val Val Gln Pro Glu Tyr Val Leu His Ile Val Gln Thr Arg Phe
20 25 30
Ala Val Asp Pro Asn Cys Gly Ala Asp Gly Thr Gly Gly Lys Gly His
35 40 45
Ala Ala Ala Gly Leu Val Gly Asp Phe His Ala Leu Ala Val Gly Gly
50 55 60
Glu Glu Gly Gly Val Val Ala Asp Asp Val Ala Cys Ala Asp Gly Gly
65 70 75 80
Lys Ala Asp Gly Arg Arg Ile Ala Arg Thr Gly Val Ala Phe Ala Ala
85 90 95
Val Asn Gly Ala Leu Phe Glu Val Ser Ala Glu Arg Ala Gly Asp Asp
100 105 110
Phe Ala His Ala
115

<210> 1681
<211> 351
<212> DNA
<213> *Neisseria meningitidis*

<400> 1681
atgccgtctg aacaatatct tttcagacgg cattttgtat ggggggtaac gggtgttcag 60
cccgagtacg tcctgcatat cgtacaaacc cgttttaccg ttacccaaa ctgcggcgcg 120
gacggcgccg gcggcaaagg tcatgcggct gcttgcccttg tgggtgattt ccacgcgctc 180
gccgtcggtg gcgaagaggg cgggtgtggtc gccgacgatg tcgcccgcgc ggacggtggc 240
aaagccgatg gtggacggat cgcgcggggc ggtgtggcct tcgcggccgt aaacggcgca 300
ttgtttgagg tctctgccga gcgcgccggc gatgacttcg cccatgcgta a 351

<210> 1682
<211> 116
<212> PRT
<213> *Neisseria meningitidis*

<400> 1682
Met Pro Ser Glu Gln Tyr Leu Phe Arg Arg His Phe Val Trp Gly Leu
1 5 10 15
Thr Val Val Gln Pro Glu Tyr Val Leu His Ile Val Gln Thr Arg Phe
20 25 30
Thr Val Tyr Pro Asn Cys Gly Ala Asp Gly Ala Gly Gly Lys Gly His
35 40 45
Ala Ala Ala Cys Leu Val Gly Asp Phe His Ala Leu Ala Val Gly Gly
50 55 60
Glu Glu Gly Gly Val Val Ala Asp Asp Val Ala Arg Ala Asp Gly Gly
65 70 75 80
Lys Ala Asp Gly Gly Arg Ile Ala Arg Ala Gly Val Ala Phe Ala Ala
85 90 95
Val Asn Gly Ala Leu Phe Glu Val Ser Ala Glu Arg Ala Gly Asp Asp
100 105 110
Phe Ala His Ala
115

<210> 1683
<211> 642
<212> DNA
<213> *Neisseria gonorrhoeae*

<400> 1683
atgcgacgac gggcagcggc atcgacaagg cgggttttgca gtccggcggtt tatcaggtct 60
tattgggcga tgcggacgtg cagtcggcgg cgttacgcag caaagagggc ggatacggcg 120
tggtgggtgc gaacgcgcgc gcttgccggc gcggaatcg agctggtgca ggaaatcgcc 180
cgggaagtgc gtttgaaaaa cgcgctcaag gcagtggcgg aagattacga ctttatcctg 240
atcgactgtc cgccttcgct gacgctgttg acgcttaacg gcttggtggc ggcgggcggc 300
gtgattgtgc cgatgttgtg cgaatattac gcgctggaag ggatttcga tttgattgcg 360
accgtgcgca aaatccgtca ggcggtcaat cccgatttg acatcacggg catcgtgcgt 420
acgatgtacg acagccgcag caggctggtt gccgaagtca gcgaacagtt gcgcagccat 480
ttcggggatt tgctttttga aaccgccatc ccgcgcaata tccgccttgc ggaagcgccg 540
agccacggta tgccggtgat ggcttacgac gcgcaggcaa aggggtgcaa ggcgtatctt 600
gccttggcgg acgaactggc ggcgaggggtg tcggggaaat ag 642

<210> 1684
<211> 213
<212> PRT
<213> *Neisseria gonorrhoeae*

<400> 1684

Met Arg Arg Arg Ala Ala Ala Ser Thr Arg Arg Val Cys Ser Pro Ala
 1 5 10 15
 Phe Ile Arg Ser Tyr Trp Ala Met Arg Thr Cys Ser Arg Arg Arg Tyr
 20 25 30
 Ala Ala Lys Arg Ala Asp Thr Ala Cys Trp Val Arg Thr Arg Ala Leu
 35 40 45
 Ala Gly Ala Glu Ile Glu Leu Val Gln Glu Ile Ala Arg Glu Val Arg
 50 55 60
 Leu Lys Asn Ala Leu Lys Ala Val Ala Glu Asp Tyr Asp Phe Ile Leu
 65 70 75 80
 Ile Asp Cys Pro Pro Ser Leu Thr Leu Leu Thr Leu Asn Gly Leu Val
 85 90 95
 Ala Ala Gly Gly Val Ile Val Pro Met Leu Cys Glu Tyr Tyr Ala Leu
 100 105 110
 Glu Gly Ile Ser Asp Leu Ile Ala Thr Val Arg Lys Ile Arg Gln Ala
 115 120 125
 Val Asn Pro Asp Leu Asp Ile Thr Gly Ile Val Arg Thr Met Tyr Asp
 130 135 140
 Ser Arg Ser Arg Leu Val Ala Glu Val Ser Glu Gln Leu Arg Ser His
 145 150 155 160
 Phe Gly Asp Leu Leu Phe Glu Thr Ala Ile Pro Arg Asn Ile Arg Leu
 165 170 175
 Ala Glu Ala Pro Ser His Gly Met Pro Val Met Ala Tyr Asp Ala Gln
 180 185 190
 Ala Lys Gly Ala Lys Ala Tyr Leu Ala Leu Ala Asp Glu Leu Ala Ala
 195 200 205
 Arg Val Ser Gly Lys
 210

<210> 1685

<211> 774

<212> DNA

<213> Neisseria meningitidis

<400> 1685

atgagtgcga acatccttgc catcgccaat cagaagggcg gtgtgggcaa aacgacgacg 60
 acggtaaatt tggcggttc gctggcatcg cgcggcaaac gcgtgctggt ggtcgatttg 120
 gatccgcagg gcaatgcgac gacgggcagc ggcacgcaca aggcgggttt gcagtcgggc 180
 gtttatcagg tcttattggg cgatgcggac gtgcagtcgg cggcggtacg cagcaaagag 240
 ggcggatacg ctgtgttggg tgcaaccgc gcgctggccg gcgcggaaat cgaactggtg 300
 caggaaatcg cccgggaagt gcgtttgaaa aacgcgctca aggcagtgga agaagattac 360
 gactttatcc tgatcgactg cccgccttcg ctgacgctgt tgacgcttaa cgggctggtg 420
 gcggcgggcg gcgtgattgt gccgatgttg tgcaatatt acgcgctgga agggatttcc 480

gatttgattg cgaccgtgcg caaaatccgt caggcgggtca atcccgattt ggacatcacg 540
ggcatcgtgc gcacgatgta cgacagccgc agcaggctgg ttgccgaagt cagcgaacag 600
ttgCGcagcc atttcgggga ttgctttttt gaaaccgtca tcccgcgcaa tatccgcctt 660
gcggaagcgc cgagccacgg tatgccggtg atggcttacg acgcgcaggc aaagggtacc 720
aaggcgtatc ttgccttggc ggacgagctg gcggcgaggg tgtcggggaa atag 774

<210> 1686

<211> 257

<212> PRT

<213> Neisseria meningitidis

<400> 1686

Met Ser Ala Asn Ile Leu Ala Ile Ala Asn Gln Lys Gly Gly Val Gly
1 5 10 15

Lys Thr Thr Thr Thr Val Asn Leu Ala Ala Ser Leu Ala Ser Arg Gly
20 25 30

Lys Arg Val Leu Val Val Asp Leu Asp Pro Gln Gly Asn Ala Thr Thr
35 40 45

Gly Ser Gly Ile Asp Lys Ala Gly Leu Gln Ser Gly Val Tyr Gln Val
50 55 60

Leu Leu Gly Asp Ala Asp Val Gln Ser Ala Ala Val Arg Ser Lys Glu
65 70 75 80

Gly Gly Tyr Ala Val Leu Gly Ala Asn Arg Ala Leu Ala Gly Ala Glu
85 90 95

Ile Glu Leu Val Gln Glu Ile Ala Arg Glu Val Arg Leu Lys Asn Ala
100 105 110

Leu Lys Ala Val Glu Glu Asp Tyr Asp Phe Ile Leu Ile Asp Cys Pro
115 120 125

Pro Ser Leu Thr Leu Leu Thr Leu Asn Gly Leu Val Ala Ala Gly Gly
130 135 140

Val Ile Val Pro Met Leu Cys Glu Tyr Tyr Ala Leu Glu Gly Ile Ser
145 150 155 160

Asp Leu Ile Ala Thr Val Arg Lys Ile Arg Gln Ala Val Asn Pro Asp
165 170 175

Leu Asp Ile Thr Gly Ile Val Arg Thr Met Tyr Asp Ser Arg Ser Arg
180 185 190

Leu Val Ala Glu Val Ser Glu Gln Leu Arg Ser His Phe Gly Asp Leu
195 200 205

Leu Phe Glu Thr Val Ile Pro Arg Asn Ile Arg Leu Ala Glu Ala Pro
210 215 220

Ser His Gly Met Pro Val Met Ala Tyr Asp Ala Gln Ala Lys Gly Thr
225 230 235 240

Lys Ala Tyr Leu Ala Leu Ala Asp Glu Leu Ala Ala Arg Val Ser Gly
245 250 255

Lys

<210> 1687

<211> 774

<212> DNA

<213> Neisseria meningitidis

<400> 1687

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atgagtgcga acatccttgc catcgccaat cagaagggcg gtgtgggcaa aacgacgacg 60
acggtaaatt tggcggcttc gctggcatcg cgcggcaaac gcgtgctggt ggtcgatttg 120
gatccgcagg gcaatgcgac gacgggcagc ggcatcgaca aggcgagttt gcagtccggc 180
gtttatcagg tcttattggg cgatgcggac gtgaaatcgg cggcggtagc cagcaaagag 240
ggcggatacg gcgtgttggg tgcgaaccgc gcgctggccg gcgcggaaat cgagctgggtg 300
caggaaatcg cccgggaagt gcgtttgaaa aacgcgctca aggcagtggc ggaagattac 360
gactttatcc tgatcgactg cccgccttcg ctgacgctgt tgacgcttaa cggcttggtg 420
gcggcaggcg gcgtgattgt gccgatgttg tgcgaatatt acgcgctgga agggatttcc 480
gatttgattg cgaccgtgcg caaaatccgt caggcgggtca atcccgattt ggatatcacg 540
ggcatcgtgc gtacgatgta cgacagccgc agcaggctag ttgccgaagt cagcgaacag 600
ttgcgcagcc atttcgggga tttgctgttt gaaaccgtca tcccgcgcaa tatccgcctt 660
gcggaagcgc cgagccacgg tatgccggtg atggcttatg atgcgcaggc aaagggtgcc 720
aaggcgatc ttgccttggc ggacgagctg atggcgaggg tgcggggaa atag 774
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<210> 1688

<211> 257

<212> PRT

<213> Neisseria meningitidis

<400> 1688

Met Ser Ala Asn Ile Leu Ala Ile Ala Asn Gln Lys Gly Gly Val Gly
1 5 10 15

Lys Thr Thr Thr Thr Val Asn Leu Ala Ala Ser Leu Ala Ser Arg Gly
20 25 30

Lys Arg Val Leu Val Val Asp Leu Asp Pro Gln Gly Asn Ala Thr Thr
35 40 45

Gly Ser Gly Ile Asp Lys Ala Ser Leu Gln Ser Gly Val Tyr Gln Val
50 55 60

Leu Leu Gly Asp Ala Asp Val Lys Ser Ala Ala Val Arg Ser Lys Glu
65 70 75 80

Gly Gly Tyr Gly Val Leu Gly Ala Asn Arg Ala Leu Ala Gly Ala Glu
85 90 95

Ile Glu Leu Val Gln Glu Ile Ala Arg Glu Val Arg Leu Lys Asn Ala
100 105 110

Leu Lys Ala Val Ala Glu Asp Tyr Asp Phe Ile Leu Ile Asp Cys Pro

| | | |
|---|-----|-----|
| 115 | 120 | 125 |
| Pro Ser Leu Thr Leu Leu Thr Leu Asn Gly Leu Val Ala Ala Gly Gly | | |
| 130 | 135 | 140 |
| Val Ile Val Pro Met Leu Cys Glu Tyr Tyr Ala Leu Glu Gly Ile Ser | | |
| 145 | 150 | 155 |
| Asp Leu Ile Ala Thr Val Arg Lys Ile Arg Gln Ala Val Asn Pro Asp | | |
| | 165 | 170 |
| Leu Asp Ile Thr Gly Ile Val Arg Thr Met Tyr Asp Ser Arg Ser Arg | | |
| | 180 | 185 |
| Leu Val Ala Glu Val Ser Glu Gln Leu Arg Ser His Phe Gly Asp Leu | | |
| | 195 | 200 |
| Leu Phe Glu Thr Val Ile Pro Arg Asn Ile Arg Leu Ala Glu Ala Pro | | |
| | 210 | 215 |
| Ser His Gly Met Pro Val Met Ala Tyr Asp Ala Gln Ala Lys Gly Ala | | |
| 225 | 230 | 235 |
| Lys Ala Tyr Leu Ala Leu Ala Asp Glu Leu Met Ala Arg Val Ser Gly | | |
| | 245 | 250 |
| | | 255 |

Lys

<210> 1689
 <211> 465
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1689
 atgctcaggg tcagaccggt attatttgcc gtcaaggctt ccgcctcttc gataccttgc 60
 agaatctgcc gattaaagcg ttcgcggctg cccaatattt tcaggcgcag attgttttcg 120
 tgcaggcggc gtacctgttt ttgcaaagcc tgtaaaaaca gcccacatcag gaacgaaact 180
 tcgtcttcgg ggcgacgcca gttttcgggt gaaaaggcaa acacggtcag atattgcacg 240
 cccagtttg gcaatgctt caccatattt tccaacgcgt ccaagccgcg tttgtgtccc 300
 attatacgcg ggagaaaacg ttttttcgcc caacggccgt tgccgtccat aattacggcg 360
 atgtgcctcg ggatggcggg gtgttccaaa atggtctgcg tgctgctctt catatctgcc 420
 tttcgcgggt cggcgttcaa atgccgtctg aacgccgcgc cgtga 465

<210> 1690
 <211> 154
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1690
 Met Leu Arg Val Arg Pro Val Leu Phe Ala Val Lys Ala Ser Ala Ser
 1 5 10 15
 Ser Ile Pro Cys Arg Ile Cys Arg Leu Lys Arg Ser Arg Leu Pro Asn
 20 25 30

Ile Phe Arg Arg Ile Leu Phe Ser Cys Arg Arg Arg Thr Cys Phe Cys
 35 40 45
 Lys Ala Cys Lys Asn Ser Pro Ile Arg Asn Glu Thr Ser Ser Ser Gly
 50 55 60
 Arg Arg Gln Phe Ser Val Glu Lys Ala Asn Thr Val Arg Tyr Cys Thr
 65 70 75 80
 Pro Ser Leu Ala Gln Cys Phe Thr Ile Phe Ser Asn Ala Ser Lys Pro
 85 90 95
 Arg Leu Cys Pro Ile Ile Arg Gly Arg Lys Arg Phe Phe Ala Gln Arg
 100 105 110
 Pro Leu Pro Ser Ile Ile Thr Ala Met Cys Leu Gly Met Ala Val Cys
 115 120 125
 Ser Lys Met Val Cys Val Leu Leu Phe Ile Ser Ala Phe Arg Gly Ser
 130 135 140
 Ala Phe Lys Cys Arg Leu Asn Ala Ala Pro
 145 150

<210> 1691
 <211> 774
 <212> DNA
 <213> Neisseria meningitidis

<400> 1691
 atgctcaggg tcaggccggt attgtttgcc gtcaacgctt ccgcctcttc gatgccttgc 60
 agaatctgcc ggttgaagcg ttccgcggtg cccaatatct tcaggcgcag attgttttcg 120
 tgcaggcggc gtacctgttt ttgcaaagcc tgtaaaaaaca gccccatcag gaacgaaact 180
 tcgtcttcgg ggcggcgccg gttttcgggt gaaaaggcaa acacggtcag atattgcaca 240
 cccagtttgg cgcaatgctt caccatattt tccaatgcgt ccaaaccgcg tttgtgtccc 300
 attatgcgcg ggaggaaacg ttttttcgcc caacggccgt tgccgtccat aatcacggcg 360
 atatgcttgg gaatggcggg gtgttccaaa acggcctgcg tgctgctttt catgtctgcc 420
 tttcgcgggt cggcattcaa atgccgtctg aacgccgaac cgtgcagggt aaattgccat 480
 caaatcttct tctttggcag tcaggagttt gtccggttcg gtaatgtatt tgcggtcag 540
 tttttgaacc gcttcttcgc cgcgacgtgc ctgctcttcg gaaatttctt tgtctttgag 600
 gagttttttg atgtggtcgt tggcatcgcg gcgcacgttg cggatagaga cgcggccttc 660
 ttccgcttcg ccgcgtacga cttaatcag gtctttgcgg cgttcctcgg tcagcatggg 720
 catcggcacg cggatcagggt cgcgacagc tgccgggttc agtcccaagt ttga 774

<210> 1692
 <211> 257
 <212> PRT
 <213> Neisseria meningitidis

<400> 1692
 Met Leu Arg Val Arg Pro Val Leu Phe Ala Val Asn Ala Ser Ala Ser
 1 5 10 15

Ser Met Pro Cys Arg Ile Cys Arg Leu Lys Arg Ser Arg Leu Pro Asn
 20 25 30
 Ile Phe Arg Arg Ile Leu Phe Ser Cys Arg Arg Arg Thr Cys Phe Cys
 35 40 45
 Lys Ala Cys Lys Asn Ser Pro Ile Arg Asn Glu Thr Ser Ser Ser Gly
 50 55 60
 Arg Arg Gln Phe Ser Val Glu Lys Ala Asn Thr Val Arg Tyr Cys Thr
 65 70 75 80
 Pro Ser Leu Ala Gln Cys Phe Thr Ile Phe Ser Asn Ala Ser Lys Pro
 85 90 95
 Arg Leu Cys Pro Ile Met Arg Gly Arg Lys Arg Phe Phe Ala Gln Arg
 100 105 110
 Pro Leu Pro Ser Ile Ile Thr Ala Ile Cys Leu Gly Met Ala Val Cys
 115 120 125
 Ser Lys Thr Ala Cys Val Leu Leu Phe Met Ser Ala Phe Arg Gly Ser
 130 135 140
 Ala Phe Lys Cys Arg Leu Asn Ala Glu Pro Cys Arg Leu Asn Cys His
 145 150 155 160
 Gln Ile Phe Phe Phe Gly Ser Gln Glu Phe Val Gly Phe Gly Asn Val
 165 170 175
 Phe Val Gly Gln Phe Leu Asn Arg Phe Phe Ala Ala Thr Cys Leu Val
 180 185 190
 Phe Gly Asn Phe Phe Val Phe Glu Glu Phe Phe Asp Val Val Val Gly
 195 200 205
 Ile Ala Ala His Val Ala Asp Arg Asp Ala Ala Phe Phe Arg Phe Ala
 210 215 220
 Ala Tyr Asp Phe Asn Gln Val Phe Ala Ala Phe Leu Gly Gln His Gly
 225 230 235 240
 His Arg His Ala Asp Gln Val Ala Asp Ser Cys Arg Val Gln Ser Gln
 245 250 255

Val

<210> 1693

<211> 774

<212> DNA

<213> Neisseria meningitidis

<400> 1693

atgctcaggg tcaggccggt attgtttgcc gtcaaggctt ccgcctcttc gatgcccttc 60
 aggatattgac ggttgaagcg ttcgcggctg cccagtattt tcaggcgcatt attgttttcg 120

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tgcaggcggc gtacctgttt ttgcaaagcc tgtaaaaaaca gccccatcag gaacgaaact 180
tcgtcttcgg ggcggcgcca gttttcgggt gaaaaggcaa acacggtcag atattgcaca 240
cccagtttgg cgcaatgctt caccatattt tccaatgcgt ccaaaccgcg tttgtgtccc 300
attatgcgcg ggaggaaaacg ttttttcgcc caacggccgt tgccgtccat aatcacggcg 360
atatgcttgg gaatggcggt gtgttcctcaa acggcctgcg tgctgctttt catgtctgcc 420
tttcgcgggt cggcattcaa atgccgtctg aacgccgaac cgtgcagggt aaattgccat 480
caaatcttct tctttggcag tcaggagttt gtcggcttcg gtaatgtatt tgcggtcag 540
tttttgaacc gcttcttcgc cgcgacgtgc ctctcttcg gaaatttctt tgtctttgag 600
gagttttttg atgtggtcgt tggcatcgcg gcgcacgttg cggatggaga cgcggccttc 660
ttccgcttcg ccgcgtacga ctttaatcag gtctttgcgg cgttcctcgg tcagcatggg 720
catcggcacg cggatcagggt cgccgacagc tgccgggttc agtcccaagt ttga 774

```

<210> 1694

<211> 256

<212> PRT

<213> Neisseria meningitidis

<400> 1694

```

Met Leu Arg Val Arg Pro Val Leu Phe Ala Val Lys Ala Ser Ala Ser
 1             5             10             15

```

```

Ser Met Pro Phe Arg Ile Arg Leu Lys Arg Ser Arg Leu Pro Ser Ile
          20             25             30

```

```

Phe Arg Arg Ile Leu Phe Ser Cys Arg Arg Arg Thr Cys Phe Cys Lys
    35             40             45

```

```

Ala Cys Lys Asn Ser Pro Ile Arg Asn Glu Thr Ser Ser Ser Gly Arg
    50             55             60

```

```

Arg Gln Phe Ser Val Glu Lys Ala Asn Thr Val Arg Tyr Cys Thr Pro
    65             70             75             80

```

```

Ser Leu Ala Gln Cys Phe Thr Ile Phe Ser Asn Ala Ser Lys Pro Arg
          85             90             95

```

```

Leu Cys Pro Ile Met Arg Gly Arg Lys Arg Phe Phe Ala Gln Arg Pro
    100            105            110

```

```

Leu Pro Ser Ile Ile Thr Ala Ile Cys Leu Gly Met Ala Val Cys Ser
    115            120            125

```

```

Lys Thr Ala Cys Val Leu Leu Phe Met Ser Ala Phe Arg Gly Ser Ala
    130            135            140

```

```

Phe Lys Cys Arg Leu Asn Ala Glu Pro Cys Arg Leu Asn Cys His Gln
    145            150            155            160

```

```

Ile Phe Phe Phe Gly Ser Gln Glu Phe Val Gly Phe Gly Asn Val Phe
    165            170            175

```

```

Val Gly Gln Phe Leu Asn Arg Phe Phe Ala Ala Thr Cys Leu Val Phe
    180            185            190

```

```

Gly Asn Phe Phe Val Phe Glu Glu Phe Phe Asp Val Val Val Gly Ile

```


195

200

205

Ala Ala His Val Ala Asp Gly Asp Ala Ala Phe Phe Arg Phe Ala Ala
210 215 220

Tyr Asp Phe Asn Gln Val Phe Ala Ala Phe Leu Gly Gln His Gly His
225 230 235 240

Arg His Ala Asp Gln Val Ala Asp Ser Cys Arg Val Gln Ser Gln Val
245 250 255

<210> 1695

<211> 393

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1695

atgctgaaac aacgggtaat aaccgctatg tggctgctgc cgctgatgct gggcatgctg 60
ttttacgcgc cgcaatggct gtgggctgca ttttgcgggc tgattgccct gaccgccttg 120
tgggagtatg cccgtatggc cggtttgtgc aaaaccgaaa ccaaccatta cctcgccgca 180
accttggttt tcggcgtagt tgcctatgcg ggcggctgga tgctgcctaa tttggtttgg 240
tatgttggtt tggcattttg gctcgccggt atgcctttgt gggttgagatt caaatggagg 300
ctcaacggcg gttggcaggt ttatgccgct ggctggcttt tgctcatgcc gttttggttc 360
gcgctcgtat cctggcgcc cgcacccga tga 393

<210> 1696

<211> 130

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1696

Met Leu Lys Gln Arg Val Ile Thr Ala Met Trp Leu Leu Pro Leu Met
1 5 10 15

Leu Gly Met Leu Phe Tyr Ala Pro Gln Trp Leu Trp Ala Ala Phe Cys
20 25 30

Gly Leu Ile Ala Leu Thr Ala Leu Trp Glu Tyr Ala Arg Met Ala Gly
35 40 45

Leu Cys Lys Thr Glu Thr Asn His Tyr Leu Ala Ala Thr Leu Val Phe
50 55 60

Gly Val Val Ala Tyr Ala Gly Gly Trp Met Leu Pro Asn Leu Val Trp
65 70 75 80

Tyr Val Val Leu Ala Phe Trp Leu Ala Val Met Pro Leu Trp Leu Arg
85 90 95

Phe Lys Trp Arg Leu Asn Gly Gly Trp Gln Val Tyr Ala Val Gly Trp
100 105 110

Leu Leu Leu Met Pro Phe Trp Phe Ala Leu Val Ser Leu Ala Pro Ala
 115 120 125

Ser Arg
 130

<210> 1697
 <211> 798
 <212> DNA
 <213> Neisseria meningitidis

<400> 1697
 atgctgaaac aacgggtaat aaccgccatg tggctgctgc cgctgatgct gggcatgctg 60
 ttttacgcgc cgcaatggtt gtgggctgca ttttgccggac tgattgccct gattgccttg 120
 tgggaatatg cccgtatggg cggtttgtgc aaaattaaaa ccaaccatta cctcgccgca 180
 accttggttt tcggcgtggt tgcctatgcg ggcggctgga tgctgcctaa tttggtttgg 240
 tatgttggtt tggcattttg gctcgccgtt atgcctttat gggtgagatt caaatggagg 300
 ctcaacggcg gttggcaggt ttatgccgtc ggctggcttc tggatcatgcc gttttgggtc 360
 gcgctcgat ccctgcgccc gcatcccgat gatgccctgc cgctgctcgc cgtgatgggt 420
 ttggtgtggg ttgccgatat ttgcgcgtat ttcagcggca aggcgttcgg caaacacaaa 480
 atcgcgccgg caatcagccc cggcaaaagc tgggaagggt caatcggcgg cgcggtttgc 540
 gtggcagtg acatgaccgc cgtacgaagt gccggctggc tggcattcga tacaggctgg 600
 ttcgataccg tgtaaatcgg tttggtgctg accgttgtca gcgtatgcgg cgacctttg 660
 gaaagctggc tcaagcgcgc ggcaggcatc aaagacagca gcaagctgct gcccggacac 720
 ggcggcgtgt tcgaccgtac cgacagcctg attgccgtta tcagcgtcta tgcagcgatg 780
 atgtcggttt taaattga 798

<210> 1698
 <211> 265
 <212> PRT
 <213> Neisseria meningitidis

<400> 1698
 Met Leu Lys Gln Arg Val Ile Thr Ala Met Trp Leu Leu Pro Leu Met
 1 5 10 15
 Leu Gly Met Leu Phe Tyr Ala Pro Gln Trp Leu Trp Ala Ala Phe Cys
 20 25 30
 Gly Leu Ile Ala Leu Ile Ala Leu Trp Glu Tyr Ala Arg Met Gly Gly
 35 40 45
 Leu Cys Lys Ile Lys Thr Asn His Tyr Leu Ala Ala Thr Leu Val Phe
 50 55 60
 Gly Val Val Ala Tyr Ala Gly Gly Trp Met Leu Pro Asn Leu Val Trp
 65 70 75 80
 Tyr Val Val Leu Ala Phe Trp Leu Ala Val Met Pro Leu Trp Leu Arg
 85 90 95
 Phe Lys Trp Arg Leu Asn Gly Gly Trp Gln Val Tyr Ala Val Gly Trp
 100 105 110
 Leu Leu Val Met Pro Phe Trp Phe Ala Leu Val Ser Leu Arg Pro His

| 115 | 120 | 125 |
|---|-----|-----|
| Pro Asp Asp Ala Leu Pro Leu Leu Ala Val Met Gly Leu Val Trp Val | | |
| 130 | 135 | 140 |
| Ala Asp Ile Cys Ala Tyr Phe Ser Gly Lys Ala Phe Gly Lys His Lys | | |
| 145 | 150 | 155 |
| Ile Ala Pro Ala Ile Ser Pro Gly Lys Ser Trp Glu Gly Ala Ile Gly | | |
| | 165 | 170 |
| Gly Ala Val Cys Val Ala Val Tyr Met Thr Ala Val Arg Ser Ala Gly | | |
| | 180 | 185 |
| Trp Leu Ala Phe Asp Thr Gly Trp Phe Asp Thr Val Leu Ile Gly Leu | | |
| | 195 | 200 |
| Val Leu Thr Val Val Ser Val Cys Gly Asp Leu Leu Glu Ser Trp Leu | | |
| | 210 | 220 |
| Lys Arg Ala Ala Gly Ile Lys Asp Ser Ser Lys Leu Leu Pro Gly His | | |
| 225 | 230 | 235 |
| Gly Gly Val Phe Asp Arg Thr Asp Ser Leu Ile Ala Val Ile Ser Val | | |
| | 245 | 250 |
| Tyr Ala Ala Met Met Ser Val Leu Asn | | |
| | 260 | 265 |

<210> 1699

<211> 798

<212> DNA

<213> Neisseria meningitidis

<400> 1699

```

atgctgaaac aacgggtgat aaccgccatg tggtctgctgc cgctgatgct gggcatgctg 60
ttttacgcgc cgcaatggtt gtgggctgca ttttgcggac tgattgccct gattgccttg 120
tggaatatg cccgatggg cggtttgtgc aaaattaaaa ccaaccatta cctcgccgca 180
accttggttt tcggcgtggt tgcctatgcg ggcggctgga tgctgcctaa tttggtttg 240
tatgttggtt tggcattttg gctcgccgtt atgcctttat gggtgagatt caaatggagg 300
ctcaacggcg gttggcagg ttatgccgtc ggctggcttc tggcatgcc gttttggttc 360
gcgctcgat ccctgcgccc gcatccgat gatgccctgc cgctgctcgc cgtgatgggt 420
ttggtgtggg ttgccgatat ttgcgcgtat ttcagcggca aggcgttcgc caaacacaaa 480
atcgaccgg caatcagccc cggcaaaagc tgggaagggt caatcggcgc cgcggtttgc 540
gtggcgtgt acatgaccgc cgtacgaagt gccggctggc tggcattcga tacaggctgg 600
ttcgataacc tgtaatcgg tttggtgttg accgttgtca gcgtatgcgc cgacctttg 660
gaaagctggc tcaagcgcgc ggcaggcatc aaagacagca gcaacctgct gcccggacac 720
ggcggcgtgt tcgaccgcac cgacagcctg attgccgtta tcagcgtcta tgcagcgatg 780
atgtcggttt taaattga

```

<210> 1700

<211> 265

<212> PRT

<213> Neisseria meningitidis

<400> 1700

Met Leu Lys Gln Arg Val Ile Thr Ala Met Trp Leu Leu Pro Leu Met
1 5 10 15
Leu Gly Met Leu Phe Tyr Ala Pro Gln Trp Leu Trp Ala Ala Phe Cys
20 25 30
Gly Leu Ile Ala Leu Ile Ala Leu Trp Glu Tyr Ala Arg Met Gly Gly
35 40 45
Leu Cys Lys Ile Lys Thr Asn His Tyr Leu Ala Ala Thr Leu Val Phe
50 55 60
Gly Val Val Ala Tyr Ala Gly Gly Trp Met Leu Pro Asn Leu Val Trp
65 70 75 80
Tyr Val Val Leu Ala Phe Trp Leu Ala Val Met Pro Leu Trp Leu Arg
85 90 95
Phe Lys Trp Arg Leu Asn Gly Gly Trp Gln Val Tyr Ala Val Gly Trp
100 105 110
Leu Leu Val Met Pro Phe Trp Phe Ala Leu Val Ser Leu Arg Pro His
115 120 125
Pro Asp Asp Ala Leu Pro Leu Leu Ala Val Met Gly Leu Val Trp Val
130 135 140
Ala Asp Ile Cys Ala Tyr Phe Ser Gly Lys Ala Phe Gly Lys His Lys
145 150 155 160
Ile Ala Pro Ala Ile Ser Pro Gly Lys Ser Trp Glu Gly Ala Ile Gly
165 170 175
Gly Ala Val Cys Val Ala Val Tyr Met Thr Ala Val Arg Ser Ala Gly
180 185 190
Trp Leu Ala Phe Asp Thr Gly Trp Phe Asp Thr Val Leu Ile Gly Leu
195 200 205
Val Leu Thr Val Val Ser Val Cys Gly Asp Leu Leu Glu Ser Trp Leu
210 215 220
Lys Arg Ala Ala Gly Ile Lys Asp Ser Ser Asn Leu Leu Pro Gly His
225 230 235 240
Gly Gly Val Phe Asp Arg Thr Asp Ser Leu Ile Ala Val Ile Ser Val
245 250 255
Tyr Ala Ala Met Met Ser Val Leu Asn
260 265

<210> 1701

<211> 501

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1701

```
atgatccgtt tgacccgcgc gtttgccgcc gccctgatcg gtttatgctg caccacaggc 60
gcgcacgccg acaccttcca aaaaatcggc tttatcaaca ccgagcgcat ctacctcgaa 120
tccaagcagg cgcgcaacat ccaaaaaacg ctggacggcg aattttccgc ccgtcaggac 180
gaattgcaaa aactgcaacg cgaaggcttg gatttgaaa ggcagctcgc cggcggcaaa 240
cttaaggacg caaaaaaggc gcaagccgaa gaaaaatggc gcgggctggg cgaagcggtc 300
cgcaaaaaac aggcgcagtt tgaagaagac tacaacctcc gccgcaacga agagtttgcc 360
tccctccagc aaaacgccaa ccgcgtcatc gtcaaatcg ccaaacagga aggttacgat 420
gtcattttgc aggacgtgat ttacgtcaac acccaatcgc acgttaccga cagcgtcatt 480
aaagaaatga acgcccgtg a 501
```

<210> 1702

<211> 166

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1702

```
Met Ile Arg Leu Thr Arg Ala Phe Ala Ala Ala Leu Ile Gly Leu Cys
  1             5             10             15

Cys Thr Thr Gly Ala His Ala Asp Thr Phe Gln Lys Ile Gly Phe Ile
      20             25             30

Asn Thr Glu Arg Ile Tyr Leu Glu Ser Lys Gln Ala Arg Asn Ile Gln
      35             40             45

Lys Thr Leu Asp Gly Glu Phe Ser Ala Arg Gln Asp Glu Leu Gln Lys
      50             55             60

Leu Gln Arg Glu Gly Leu Asp Leu Glu Arg Gln Leu Ala Gly Gly Lys
      65             70             75             80

Leu Lys Asp Ala Lys Lys Ala Gln Ala Glu Glu Lys Trp Arg Gly Leu
      85             90             95

Val Glu Ala Phe Arg Lys Lys Gln Ala Gln Phe Glu Glu Asp Tyr Asn
      100            105            110

Leu Arg Arg Asn Glu Glu Phe Ala Ser Leu Gln Gln Asn Ala Asn Arg
      115            120            125

Val Ile Val Lys Ile Ala Lys Gln Glu Gly Tyr Asp Val Ile Leu Gln
      130            135            140

Asp Val Ile Tyr Val Asn Thr Gln Tyr Asp Val Thr Asp Ser Val Ile
      145            150            155            160

Lys Glu Met Asn Ala Arg
      165
```

<210> 1703

<211> 501

<212> DNA

<213> Neisseria meningitidis

<400> 1703

```
atgacccggtt tgacccgcgc gtttgccgcg gctctgatcg gtttgtgctg caccgcaggc 60
gcgcacgccg acaccttcca aaaaatcggc tttatcaaca ccgagcgcat ctacctcgaa 120
tccaagcagg cgcgcaagat tcaaaaaacg ctggacagcg aattttccgc tcgtcaggac 180
gaattgcaaa aactgcaacg cgaaggtctg gatttggaaa ggcagcttgc cgaaggcaaaa 240
ctcagaaaacg caaaaaaggc gcaagccgaa gaaaaatggc gcgggctggg cgcagcgttc 300
cgcaaaaaac aggcgcagtt tgaagaagac tacaacctcc gccgcaacga agagtgtgcc 360
tccctccagc aaaacgccaa ccgcgtcatc gtcaaaatcg ccaaacagga aggttacgat 420
gtcattttgc agaacgtgat ttacgtcaac acccaatacg acgttaccga cagcgtcatt 480
aaagaaatga acgcccgtg a 501
```

<210> 1704

<211> 166

<212> PRT

<213> Neisseria meningitidis

<400> 1704

```
Met Thr Arg Leu Thr Arg Ala Phe Ala Ala Ala Leu Ile Gly Leu Cys
  1             5             10             15

Cys Thr Ala Gly Ala His Ala Asp Thr Phe Gln Lys Ile Gly Phe Ile
      20             25             30

Asn Thr Glu Arg Ile Tyr Leu Glu Ser Lys Gln Ala Arg Lys Ile Gln
      35             40             45

Lys Thr Leu Asp Ser Glu Phe Ser Ala Arg Gln Asp Glu Leu Gln Lys
      50             55             60

Leu Gln Arg Glu Gly Leu Asp Leu Glu Arg Gln Leu Ala Glu Gly Lys
      65             70             75             80

Leu Arg Asn Ala Lys Lys Ala Gln Ala Glu Glu Lys Trp Arg Gly Leu
      85             90             95

Val Ala Ala Phe Arg Lys Lys Gln Ala Gln Phe Glu Glu Asp Tyr Asn
      100            105            110

Leu Arg Arg Asn Glu Glu Phe Ala Ser Leu Gln Gln Asn Ala Asn Arg
      115            120            125

Val Ile Val Lys Ile Ala Lys Gln Glu Gly Tyr Asp Val Ile Leu Gln
      130            135            140

Asn Val Ile Tyr Val Asn Thr Gln Tyr Asp Val Thr Asp Ser Val Ile
      145            150            155            160

Lys Glu Met Asn Ala Arg
      165
```

<210> 1705

<211> 501

<212> DNA

<213> Neisseria meningitidis

<400> 1705

```
atgacccggtt tgacccgcgc gtttgccgcg gctctgatcg gtttgtgctg caccgcaggc 60
gcgcacgccg acaccttcca aaaaatcggc tttatcaaca ccgagcgcat ctacctcgaa 120
tccaagcagg cgcgcaagat tcaaaaaacg ctggacagcg aattttccgc ccgccaggac 180
gaattgcaaa aactgcaacg cgaagggtctg gatttggaag ggcagcttgc cgaaggcaaa 240
ctcaaagacg caaaaaaggc gcaagccgaa gaaaaatggg gcgggctggg cgagcggttc 300
cgcaaaaaac aggcgcagtt tgaagaagac tacaacctcc gccgcaacga agagtttgcc 360
tccctccagc aaaacgccaa ccgcgtcatc gtcaaatcg ccaaacagga aggttacgat 420
gtcattttgc aggacgtgat ttacgtcaac acccaatcg acgttaccga cagcgtcatt 480
aaagaaatga acgcccgcgtg a 501
```

<210> 1706

<211> 166

<212> PRT

<213> Neisseria meningitidis

<400> 1706

```
Met Thr Arg Leu Thr Arg Ala Phe Ala Ala Ala Leu Ile Gly Leu Cys
 1             5             10             15

Cys Thr Ala Gly Ala His Ala Asp Thr Phe Gln Lys Ile Gly Phe Ile
      20             25             30

Asn Thr Glu Arg Ile Tyr Leu Glu Ser Lys Gln Ala Arg Lys Ile Gln
      35             40             45

Lys Thr Leu Asp Ser Glu Phe Ser Ala Arg Gln Asp Glu Leu Gln Lys
      50             55             60

Leu Gln Arg Glu Gly Leu Asp Leu Glu Arg Gln Leu Ala Glu Gly Lys
      65             70             75             80

Leu Lys Asp Ala Lys Lys Ala Gln Ala Glu Glu Lys Trp Cys Gly Leu
      85             90             95

Val Ala Ala Phe Arg Lys Lys Gln Ala Gln Phe Glu Glu Asp Tyr Asn
      100            105            110

Leu Arg Arg Asn Glu Glu Phe Ala Ser Leu Gln Gln Asn Ala Asn Arg
      115            120            125

Val Ile Val Lys Ile Ala Lys Gln Glu Gly Tyr Asp Val Ile Leu Gln
      130            135            140

Asp Val Ile Tyr Val Asn Thr Gln Tyr Asp Val Thr Asp Ser Val Ile
      145            150            155            160

Lys Glu Met Asn Ala Arg
      165
```

<210> 1707

<211> 357

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1707

```
atgcgcgttt tccgagtaaa ccgatttggt gttaccgttt tcggcggcgg tataggttct 60
gccgtccac acgtgcctg cgtcggcaaa caggctcagg cggacggtgc gtgcgtcttt 120
cgcaccgggc atcgggaaga gcagctcggc ggagacgttg gcttttttgt tgccgccgta 180
gctgattttt tcgccgtatt cgtcatacac tttcggggccg agcgtgccgc tttcgtagcc 240
gcgcaccgaa cccaggccgc cgcgtagaa gttttcaaag aaggggattt ctttggttct 300
gccgtagccg cccgcaatgc cgacttcgcc gccgagcatc agcgtgaagg ttttgct 357
```

<210> 1708

<211> 119

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1708

```
Met Arg Val Phe Arg Val Asn Arg Phe Val Val Thr Val Phe Gly Gly
  1             5             10             15

Gly Ile Gly Ser Ala Val Pro His Ala Ala Cys Val Gly Lys Gln Ala
      20             25             30

Gln Ala Asp Gly Ala Cys Val Phe Arg Thr Gly His Arg Glu Glu Gln
      35             40             45

Leu Gly Gly Asp Val Gly Phe Val Ala Ala Val Ala Asp Phe Phe
      50             55             60

Ala Val Phe Val Ile His Phe Arg Ala Glu Arg Ala Ala Phe Val Ala
      65             70             75             80

Ala His Arg Thr Gln Ala Ala Ala Val Glu Val Phe Lys Glu Gly Asp
      85             90             95

Phe Phe Gly Ser Ala Val Ala Ala Arg Asn Ala Asp Phe Ala Ala Glu
      100            105            110

His Gln Arg Glu Gly Phe Ala
      115
```

<210> 1709

<211> 483

<212> DNA

<213> Neisseria meningitidis

<400> 1709

```
atgggtattg ccggcgccgt aaatgttttg aaccctgccg ccggtcgcgg aactgctgtt 60
gtcgtcgtag gttttgccgt cccacacgct gcctgcgtcg gcaaacaggc tcaggcggac 120
gggtgcgcgcg tctttcgcgc cgggcatcgg gaagagcagc tcggcggaga cgttggcttt 180
tttgttgccg ccgtagctga ttttttcgcc gtattcgtca tagactttcg gaccgagcgt 240
gccgctttcg tatccgcgca ccgaaccag gccgccgccg tagaagtttt caaagaagg 300
gatttctttg gttctgccgt agccgccgc aatgccgact tcgccgccga gcatcagcgt 360
gaaggttttg ctcaggggga agaaccaggt ttggttggtg gtggcggagt agtattgcag 420
tttgctgccca ggcagggcga tttcggcggt caccgccgtc aggtagccgc gcgtcggcca 480
```


<210> 1710
 <211> 160
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1710
 Met Gly Ile Ala Gly Ala Val Asn Val Leu Asn Pro Ala Ala Gly Arg
 1 5 10 15
 Gly Thr Ala Val Val Val Val Gly Phe Ala Val Pro His Ala Ala Cys
 20 25 30
 Val Gly Lys Gln Ala Gln Ala Asp Gly Ala Arg Val Phe Arg Ala Gly
 35 40 45
 His Arg Glu Glu Gln Leu Gly Gly Asp Val Gly Phe Phe Val Ala Ala
 50 55 60
 Val Ala Asp Phe Phe Ala Val Phe Val Ile Asp Phe Arg Thr Glu Arg
 65 70 75 80
 Ala Ala Phe Val Ser Ala His Arg Thr Gln Ala Ala Ala Val Glu Val
 85 90 95
 Phe Lys Glu Gly Asp Phe Phe Gly Ser Ala Val Ala Ala Arg Asn Ala
 100 105 110
 Asp Phe Ala Ala Glu His Gln Arg Glu Gly Phe Ala Gln Gly Glu Glu
 115 120 125
 Pro Gly Leu Val Val Gly Gly Gly Val Val Leu Gln Phe Ala Ala Arg
 130 135 140
 Gln Gly Asp Phe Gly Val His Ala Arg Gln Val Ala Ala Arg Arg Pro
 145 150 155 160

<210> 1711
 <211> 483
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1711
 atgggtattg ccggcgccgt aaatgttttg aaccctgccg ccggtcgcgg aactgctgtt 60
 gtcgtcgtag gttttgccgt cccacacgct gcctgcgtcg gcaaacaggc tcaggcggac 120
 ggtgcgcgcg tctttcgcgc cgggcatcgg gaagagcagc tcggcggaga cgttggcttt 180
 tttgttgccg ccgtagctga ttttttcgcc gtattcgtea tacactttcg gaccgagcgt 240
 gccgctttcg tatccgcgca ccgaaccag gccgccgccc tagaagtttt caaagaaggg 300
 gattttctttg gttctgccgt agccgccgc aatgccgact tcgccgccga gcatcagcgt 360
 gaaggttttg ctttaaggga agaaccaggt ttggttggtg gtggcggagt agtattgcag 420
 tttgctgccg ggcagggcga tttcggcggt caccgccgtc aggtagccgc gcgtcggcca 480

<210> 1712

<211> 159

<212> PRT

<213> *Neisseria meningitidis*

<400> 1712

Met Gly Ile Ala Gly Ala Val Asn Val Leu Asn Pro Ala Ala Gly Arg
 1 5 10 15

Gly Thr Ala Val Val Val Val Gly Phe Ala Val Pro His Ala Ala Cys
 20 25 30

Val Gly Lys Gln Ala Gln Ala Asp Gly Ala Arg Val Phe Arg Ala Gly
 35 40 45

His Arg Glu Glu Gln Leu Gly Gly Asp Val Gly Phe Phe Val Ala Ala
 50 55 60

Val Ala Asp Phe Phe Ala Val Phe Val Ile His Phe Arg Thr Glu Arg
 65 70 75 80

Ala Ala Phe Val Ser Ala His Arg Thr Gln Ala Ala Ala Val Glu Val
 85 90 95

Phe Lys Glu Gly Asp Phe Phe Gly Ser Ala Val Ala Ala Arg Asn Ala
 100 105 110

Asp Phe Ala Ala Glu His Gln Arg Glu Gly Phe Ala Gly Glu Glu Pro
 115 120 125

Gly Leu Val Val Gly Gly Gly Val Val Leu Gln Phe Ala Ala Gly Gln
 130 135 140

Gly Asp Phe Gly Val His Ala Arg Gln Val Ala Ala Arg Arg Pro
 145 150 155

<210> 1713

<211> 888

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1713

atgtgcgcca tcgtcggggc ggcggggctg ccttccgcgc tcgcagcggc gcaaaaaggc 60
 aaaaccattt atctggcaaa caaagaaacg ctggtggttt ccggcgcggtt gtttatggaa 120
 accgcccgcg caaacggcgc gccagtgttg cccgtcgaca gcgaacacaa cgccattttc 180
 caagttttgc cgcgcgatta cacagaccgt ctgaacgaac acggcatcga ttcgattatc 240
 ctgaccgctt ccggcggccc gtttttaaca accgatttaa gcacgttcga cagcattacg 300
 cccgagcagg cgggtcaaaca cccaatttg cgtatggggc gcaaaatctc cgtcgattca 360
 gccactatgg caaacaaggg cttggaactg attgaagcgc attggctggt caactgtccg 420
 cccgacaaac tcgaagtcgt catccatccc caatccgtga tacacagtat ggtgcgctac 480
 cgcgacggct ccgtgctggc gcaactgggc aatcccgata tgcgaaacgcc catcgccctat 540
 tgtttgggct tgcccagcgc catcgattcg ggtgtcggca aactcgattt cggcgcattg 600
 tccgcgctga ctttcaaaa gcccgacttc ggccgcttcc cctgcctgaa gttcgcctat 660

```

gaaaccataa acgcaggcgg agccgcgccc tgcgtattga acgcgcgcaa cgaaaccgcc 720
gtcgcgcgct ttttgacgg acagattaag tttaccgaca ttgccaaaac cgtcgcccac 780
tgtcttgcaac aagacttttc aaacggcatg ggcgatatag aaggactgtt ggcgcaagat 840
gcccggacac gcgcacaagc gcgggcattt atcggcacac tgcgctga 888

```

<210> 1714

<211> 250

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1714

```

Met Cys Ala Ile Val Gly Ala Ala Gly Leu Pro Ser Ala Leu Ala Ala
  1              5              10              15

Ala Gln Lys Gly Lys Thr Ile Tyr Leu Ala Asn Lys Glu Thr Leu Val
      20              25              30

Val Ser Gly Ala Leu Phe Met Glu Thr Ala Arg Ala Asn Gly Ala Ala
      35              40              45

Val Leu Pro Val Asp Ser Glu His Asn Ala Ile Phe Gln Val Leu Pro
      50              55              60

Arg Asp Tyr Thr Asp Arg Leu Asn Glu His Gly Ile Asp Ser Ile Ile
      65              70              75              80

Leu Thr Ala Ser Gly Gly Pro Phe Leu Thr Thr Asp Leu Ser Thr Phe
      85              90              95

Asp Ser Ile Thr Pro Glu Gln Ala Val Lys His Pro Asn Trp Arg Met
      100             105             110

Gly Arg Lys Ile Ser Val Asp Ser Ala Thr Met Ala Asn Lys Gly Leu
      115             120             125

Glu Leu Ile Glu Ala His Trp Leu Phe Asn Cys Pro Pro Asp Lys Leu
      130             135             140

Glu Val Val Ile His Pro Gln Ser Val Ile His Ser Met Val Arg Tyr
      145             150             155             160

Arg Asp Gly Ser Val Leu Ala Gln Leu Gly Asn Pro Asp Met Arg Thr
      165             170             175

Pro Ile Ala Tyr Cys Leu Gly Leu Pro Glu Arg Ile Asp Ser Gly Val
      180             185             190

Gly Lys Leu Asp Phe Gly Ala Leu Ser Ala Leu Thr Phe Gln Lys Pro
      195             200             205

Asp Phe Gly Arg Phe Pro Cys Leu Lys Phe Ala Tyr Glu Thr Ile Asn
      210             215             220

Ala Gly Gly Ala Ala Pro Cys Val Leu Asn Ala Ala Asn Glu Thr Ala
      225             230             235             240

```

Val Ala Ala Phe Leu Asp Gly Gln Ile Lys
 245 250

<210> 1715
 <211> 888
 <212> DNA
 <213> Neisseria meningitidis

<400> 1715
 atgtgcgcca tcgtcggggc ggtggggctg ccttccgcgc tcgcagcggc gcaaaaaggc 60
 aaaaccattt atctggcaaa caaagaaacg ctggtgggtt ccggcgcggt gtttatggaa 120
 accgcccgtg caaacggcgc ggcagtgtg cccgtcgaca gcgaacacaa cgccgttttc 180
 caagttttgc cgcgcgatta cgccggccgt ctgaacgaac acggcatcgc ttcgattatc 240
 ctgaccgctt ccggcggccc gtttctgacc gccgatttaa acacgttcga ccgcattacg 300
 cccgccaag cggtaaaaca cccaattgg cgtatgggac gcaaaatctc cgtcgattcc 360
 gccaccatga tgaacaaagg tttggagctg attgaagcgc attggctgtt caactgtccg 420
 cccgacaaac tcgaagtcgt catccatccg caatccgtga tacacagcat ggtgcgctac 480
 cgcgacggct ccgtgctggc gcaactgggc aatcccata tgcgaacgcc catcgcttat 540
 tgtttgggtt tgcccagcgc catcgattcg ggtgtcggcg acctggattt cgacgcattg 600
 tccgcgctga ccttccaaaa gcccgacttt gaccgcttcc cctgcctgag gctcgcctat 660
 gaagccatga acgcaggcgc agccgcgcc tcggtattga acgcgcgcaa cgaagccgcc 720
 gtcgcccgtt ttttgacgg acagattaag tttaccgaca ttgccaaaac cgtcgcccac 780
 tgtcttgac aagacttttc agacggcata ggcatatag gggggctctt ggcgcaagat 840
 gcccgacac gcgcacaagc gcgagcattt atcggcacac tgcgctga 888

<210> 1716
 <211> 295
 <212> PRT
 <213> Neisseria meningitidis

<400> 1716
 Met Cys Ala Ile Val Gly Ala Val Gly Leu Pro Ser Ala Leu Ala Ala
 1 5 10 15
 Ala Gln Lys Gly Lys Thr Ile Tyr Leu Ala Asn Lys Glu Thr Leu Val
 20 25 30
 Val Ser Gly Ala Leu Phe Met Glu Thr Ala Arg Ala Asn Gly Ala Ala
 35 40 45
 Val Leu Pro Val Asp Ser Glu His Asn Ala Val Phe Gln Val Leu Pro
 50 55 60
 Arg Asp Tyr Ala Gly Arg Leu Asn Glu His Gly Ile Ala Ser Ile Ile
 65 70 75 80
 Leu Thr Ala Ser Gly Gly Pro Phe Leu Thr Ala Asp Leu Asn Thr Phe
 85 90 95
 Asp Arg Ile Thr Pro Ala Gln Ala Val Lys His Pro Asn Trp Arg Met
 100 105 110
 Gly Arg Lys Ile Ser Val Asp Ser Ala Thr Met Met Asn Lys Gly Leu
 115 120 125

Glu Leu Ile Glu Ala His Trp Leu Phe Asn Cys Pro Pro Asp Lys Leu
 130 135 140
 Glu Val Val Ile His Pro Gln Ser Val Ile His Ser Met Val Arg Tyr
 145 150 155 160
 Arg Asp Gly Ser Val Leu Ala Gln Leu Gly Asn Pro Asp Met Arg Thr
 165 170 175
 Pro Ile Ala Tyr Cys Leu Gly Leu Pro Glu Arg Ile Asp Ser Gly Val
 180 185 190
 Gly Asp Leu Asp Phe Asp Ala Leu Ser Ala Leu Thr Phe Gln Lys Pro
 195 200 205
 Asp Phe Asp Arg Phe Pro Cys Leu Arg Leu Ala Tyr Glu Ala Met Asn
 210 215 220
 Ala Gly Gly Ala Ala Pro Cys Val Leu Asn Ala Ala Asn Glu Ala Ala
 225 230 235 240
 Val Ala Ala Phe Leu Asp Gly Gln Ile Lys Phe Thr Asp Ile Ala Lys
 245 250 255
 Thr Val Ala His Cys Leu Ala Gln Asp Phe Ser Asp Gly Ile Gly Asp
 260 265 270
 Ile Gly Gly Leu Leu Ala Gln Asp Ala Arg Thr Arg Ala Gln Ala Arg
 275 280 285
 Ala Phe Ile Gly Thr Leu Arg
 290 295

<210> 1717

<211> 888

<212> DNA

<213> *Neisseria meningitidis*

<400> 1717

```

atgtgcgcca tcgtcggggc ggtggggctg ccttccgcgc tcgcagcggc gcaaaaaggc 60
aaaaccattt atctggcgaa caaagagacg ctggtggttt ccggcgcggt gtttatggaa 120
accgcccgtg caaacggcgc ggcagtgcgt cccgtcgaca gcgaacacaa cgccgttttc 180
caagttttgc cgcgcgatta cacaggtcgc ctgaacgaac acggcatcgc ttcgattatc 240
ctgaccgctt ccggcggccc gtttctgacc gccgatttaa acacgttcga cagcattacg 300
cccgaaccaag cgggtcaaaca cccaattgg cgtatgggac gcaaaatctc cgtcgattcc 360
gccaccatga tgaacaaagg tttggagctg attgaagcgc attggctggt caactgtccg 420
cccgacaaac tcgaagtcgt catccatccg caatctgtga tacacagcat ggtgcgctac 480
cgcgacggct ccgtgttggc gcaactgggc aatcccagata tgcgaacgcc tatcgcttat 540
tgtttgggtt tgcccagcgc catcgattcg ggtgtcggcg acctggattt cgacgcattg 600
tccgcgctga ctttccaaaa gcccgacttt gaccgcttcc cctgcctgaa gctcgcctat 660
gaagccatga acgcaggcgg agccgcgcc tgcgtattga acgccgcaa cgaagccgcc 720
gtcgcgcctt ttttgacgg acagattaag tttaccgaca ttgccaaaac cgtcgcctat 780
tgtctttcac aagacttttc agacggcata ggcgacatag gggggctctt ggcgcaagat 840
gcccggacac gcgcacaagc gcgggcattt atcggcacac tgcgctga 888
  
```

<210> 1718
<211> 295
<212> PRT
<213> Neisseria meningitidis

<400> 1718

```
Met Cys Ala Ile Val Gly Ala Val Gly Leu Pro Ser Ala Leu Ala Ala
  1           5           10           15

Ala Gln Lys Gly Lys Thr Ile Tyr Leu Ala Asn Lys Glu Thr Leu Val
      20           25           30

Val Ser Gly Ala Leu Phe Met Glu Thr Ala Arg Ala Asn Gly Ala Ala
      35           40           45

Val Leu Pro Val Asp Ser Glu His Asn Ala Val Phe Gln Val Leu Pro
      50           55           60

Arg Asp Tyr Thr Gly Arg Leu Asn Glu His Gly Ile Ala Ser Ile Ile
      65           70           75           80

Leu Thr Ala Ser Gly Gly Pro Phe Leu Thr Ala Asp Leu Asn Thr Phe
      85           90           95

Asp Ser Ile Thr Pro Asp Gln Ala Val Lys His Pro Asn Trp Arg Met
      100          105          110

Gly Arg Lys Ile Ser Val Asp Ser Ala Thr Met Met Asn Lys Gly Leu
      115          120          125

Glu Leu Ile Glu Ala His Trp Leu Phe Asn Cys Pro Pro Asp Lys Leu
      130          135          140

Glu Val Val Ile His Pro Gln Ser Val Ile His Ser Met Val Arg Tyr
      145          150          155          160

Arg Asp Gly Ser Val Leu Ala Gln Leu Gly Asn Pro Asp Met Arg Thr
      165          170          175

Pro Ile Ala Tyr Cys Leu Gly Leu Pro Glu Arg Ile Asp Ser Gly Val
      180          185          190

Gly Asp Leu Asp Phe Asp Ala Leu Ser Ala Leu Thr Phe Gln Lys Pro
      195          200          205

Asp Phe Asp Arg Phe Pro Cys Leu Lys Leu Ala Tyr Glu Ala Met Asn
      210          215          220

Ala Gly Gly Ala Ala Pro Cys Val Leu Asn Ala Ala Asn Glu Ala Ala
      225          230          235          240

Val Ala Ala Phe Leu Asp Gly Gln Ile Lys Phe Thr Asp Ile Ala Lys
      245          250          255

Thr Val Ala His Cys Leu Ser Gln Asp Phe Ser Asp Gly Ile Gly Asp
      260          265          270
```

Ile Gly Gly Leu Leu Ala Gln Asp Ala Arg Thr Arg Ala Gln Ala Arg
 275 280 285

Ala Phe Ile Gly Thr Leu Arg
 290 295

<210> 1719
 <211> 1095
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1719
 atgccctggt tgtgccgcct taatcgcaat atcggcagtt tccaaatcac gaatctcacc 60
 gaccataatg atgtccgggt cctgacgcag gaaagacttc aaagcagcgg caaaagtcag 120
 accctgctta tcattgacgt taacctgatt gatgcccggc aggttaatct cggcagggtc 180
 ttccgccggt gcaatattta ccgactccgt attcaaaata ttcaaacagg tatagagcga 240
 caccgtctta cccgaaccgg tcggaccggt taccagcacc atcccgttaag gacggtgaat 300
 cgcttccaac aacaattttt tctggaacgg ctcaaaacgg agctgggtcga tgttcaaaga 360
 cgcggcatcg gaattcaaaa tccgcatcac gaccttttcg ccaaacagcg tcggcaatgt 420
 gctgacacgg aaatcgacag gcttgccgcc cttttgaaag gtcagctgca tcctaccgtc 480
 ctgcggtatc cgtttttcgg aaatgtccaa acgcgacatt accttaatcc gggaagcaag 540
 ctgccccctt accgcaatgg gcggctgaac cacctcggcg agctgcccgt ccacacggaa 600
 acggatacgc gcatttgtgt cgtaaaactc gaaatggatg tcggatgccc cgctacgcaa 660
 ggcattccgac aaagtattat ggataaacct cggaacaggg ccgtcttctg cctcctcgtc 720
 gtogatatac aggggtgtggc ttctctcttc ctcttgcccc tccccaagct cctgaagcag 780
 cgatgtcgaa cgcgaaccca cccaatcgag caaaccggcc aactgggtcat cctcgacaat 840
 gaccaactca accgcaatcc ctgcggcaga aaccggtttt tgaatttgcg gcattctgggt 900
 cggatcggaa accgcaaaaa ataccttctg gcccccacgg aaaaccggca cacagtggaa 960
 ctccaccatc tgctctctcg tcaacacccc catcagcacc ctgtggcgcg gataatgacg 1020
 caaatcaaga atcgaataac tgaacaccct cgcaatcaat gccgcaagcg acttgggcga 1080
 aatgacaccg tctga 1095

<210> 1720
 <211> 364
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1720
 Met Pro Cys Leu Cys Arg Leu Asn Arg Asn Ile Gly Ser Phe Gln Ile
 1 5 10 15
 Thr Asn Leu Thr Asp His Asn Asp Val Arg Val Leu Thr Gln Glu Arg
 20 25 30
 Leu Gln Ser Ser Gly Lys Ser Gln Thr Leu Leu Ile Ile Asp Val Asn
 35 40 45
 Leu Ile Asp Ala Arg Gln Val Asn Leu Gly Arg Val Phe Arg Arg Cys
 50 55 60
 Asn Ile Tyr Arg Leu Arg Ile Gln Asn Ile Gln Thr Gly Ile Glu Arg
 65 70 75 80
 His Arg Leu Thr Arg Thr Arg Arg Thr Gly Tyr Gln His His Pro Val
 85 90 95

Arg Thr Val Asn Arg Phe Gln Gln Gln Phe Phe Leu Glu Arg Leu Lys
 100 105 110
 Thr Glu Leu Val Asp Val Gln Arg Arg Gly Ile Gly Ile Gln Asn Pro
 115 120 125
 His His Asp Leu Phe Ala Lys Gln Arg Arg Gln Cys Ala Asp Thr Glu
 130 135 140
 Ile Asp Arg Leu Ala Ala Leu Leu Lys Gly Gln Leu His Pro Thr Val
 145 150 155 160
 Leu Arg Tyr Pro Phe Phe Gly Asn Val Gln Thr Arg His Tyr Leu Asn
 165 170 175
 Pro Gly Ser Lys Leu Pro Pro Tyr Arg Asn Gly Arg Leu Asn His Leu
 180 185 190
 Ala Glu Leu Pro Val His Thr Glu Thr Asp Thr Arg Ile Val Phe Val
 195 200 205
 Lys Leu Glu Met Asp Val Gly Cys Pro Ala Thr Gln Gly Ile Arg Gln
 210 215 220
 Ser Phe Met Asp Lys Pro Arg Asn Arg Ala Val Phe Cys Leu Leu Val
 225 230 235 240
 Val Asp Ile Gln Gly Val Ala Phe Leu Phe Leu Leu Pro Leu Pro Lys
 245 250 255
 Leu Leu Lys Gln Arg Cys Arg Thr Arg Thr His Pro Ile Glu Gln Thr
 260 265 270
 Arg Gln Leu Val Ile Leu Asp Asn Asp Gln Leu Asn Arg Asn Pro Cys
 275 280 285
 Gly Arg Asn Arg Phe Leu Asn Leu Arg His Leu Gly Arg Ile Gly Asn
 290 295 300
 Arg Lys Lys Tyr Phe Val Ala Pro Thr Glu Asn Arg His Thr Val Glu
 305 310 315 320
 Leu His His Leu Leu Leu Arg Gln His Pro His Gln His Pro Val Ala
 325 330 335
 Arg Ile Met Thr Gln Ile Lys Asn Arg Ile Thr Glu His Pro Arg Asn
 340 345 350
 Gln Cys Arg Lys Arg Leu Gly Arg Asn Asp Thr Val
 355 360

<210> 1721

<211> 1094

<212> DNA

<213> Neisseria meningitidis

<400> 1721

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gccctgctta tcattgacgt taacctgatt gatgcccggc aggttaatct cggcagggtc 180
ttccgcgcgtt gcaatattta ccgactccgt attcaaaaata ttcaaacagg tatagagcga 240
caccgctctta cccgaacccg tcggaccggt taccagcacc atcccgtagg gacgggtgaat 300
cgctaccaac acawtttttt ctgaaacggc tcaaaaccga gctggtcgat gttcaaagac 360
gcggcacatcgg aattcaaaat ccgcatcacg accttttcgc caaacagcgt cggcaatgtg 420
ctgacacgga aatcgacagg cttgccgccc ttttgaaagg tcagctgcat cctgccgtcc 480
tgcggtatcc gtttttcgga aatgtccaaa cgcgacatta ccttaatccg tgaagcaagc 540
tgccccctta ccgcaatggg cgggtgaacc acctcgcgga gctgcccgtc cacacggaaa 600
cggatacggg cattgtgttc gtaaaactcg aaatggatgt ccgatgcccc gctgcgcaag 660
gcatccgcga aagtcttatg gataaacctc ggaacagggc cgtcttctgc ctccctcgtt 720
tcgatataca ggggtgtggt ttcctcttcc tcttgcacct ccccaagctc ctgaagcagc 780
gatgtcgaac gcgaaccac ccaatcgagc aaaccgcga actggtcacc ctgcacaatg 840
accaactcaa cctcaatccc tgcggcagaa acggttttct gaatttgcg catctgtgtc 900
ggatcggaac ccgcaaaaaa tactttgtcg ccccgacgga aaaccggcac acagtgaac 960
tccaccatct gtcctccgt caacacccc atcagcacc tgtggcgcg ataatgacgc 1020
aaatcaagaa tcgaataact gaacaccctc gcaatcaatg ccgcaagcga cttgggcgaa 1080
atgacaccgt ctga 1094
```

<210> 1722

<211> 363

<212> PRT

<213> *Neisseria meningitidis*

<400> 1722

```
Met Pro Cys Leu Cys Arg Leu Asn Arg Asn Ile Gly Ser Phe Gln Ile
  1              5              10              15
```

```
Thr Asn Leu Thr Asp His Asn Asp Val Arg Val Leu Thr Gln Glu Arg
      20              25              30
```

```
Leu Gln Ser Ser Gly Lys Ser Gln Ala Leu Leu Ile Ile Asp Val Asn
      35              40              45
```

```
Leu Ile Asp Ala Arg Gln Val Asn Leu Gly Arg Val Phe Arg Arg Cys
      50              55              60
```

```
Asn Ile Tyr Arg Leu Arg Ile Gln Asn Ile Gln Thr Gly Ile Glu Arg
      65              70              75              80
```

```
His Arg Leu Thr Arg Thr Arg Arg Thr Gly Tyr Gln His His Pro Val
      85              90              95
```

```
Gly Thr Val Asn Arg Tyr Gln His Xaa Phe Phe Leu Lys Arg Leu Lys
      100             105             110
```

```
Thr Glu Leu Val Asp Val Gln Arg Arg Gly Ile Gly Ile Gln Asn Pro
      115             120             125
```

```
His His Asp Leu Phe Ala Lys Gln Arg Arg Gln Cys Ala Asp Thr Glu
      130             135             140
```

```
Ile Asp Arg Leu Ala Ala Leu Leu Lys Gly Gln Leu His Pro Ala Val
```

| | | | | | | |
|---|-----|-----|-----|-----|-----|-----|
| 145 | | 150 | | 155 | | 160 |
| Leu Arg Tyr Pro Phe Phe Gly Asn Val Gln Thr Arg His Tyr Leu Asn | | | | | | |
| | 165 | | 170 | | 175 | |
| Pro Ser Lys Leu Pro Pro Tyr Arg Asn Gly Arg Leu Asn His Leu Ala | | | | | | |
| | 180 | | 185 | | 190 | |
| Glu Leu Pro Val His Thr Glu Thr Asp Thr Gly Ile Val Phe Val Lys | | | | | | |
| | 195 | | 200 | | 205 | |
| Leu Glu Met Asp Val Arg Cys Pro Ala Ala Gln Gly Ile Arg Gln Ser | | | | | | |
| | 210 | | 215 | | 220 | |
| Leu Met Asp Lys Pro Arg Asn Arg Ala Val Phe Cys Leu Leu Val Val | | | | | | |
| | 225 | | 230 | | 235 | 240 |
| Asp Ile Gln Gly Val Ala Phe Leu Phe Leu Leu Pro Leu Pro Lys Leu | | | | | | |
| | 245 | | 250 | | 255 | |
| Leu Lys Gln Arg Cys Arg Thr Arg Thr His Pro Ile Glu Gln Thr Arg | | | | | | |
| | 260 | | 265 | | 270 | |
| Gln Leu Val Ile Leu Asp Asn Asp Gln Leu Asn Leu Asn Pro Cys Gly | | | | | | |
| | 275 | | 280 | | 285 | |
| Arg Asn Gly Phe Leu Asn Leu Arg His Leu Cys Arg Ile Gly Asn Arg | | | | | | |
| | 290 | | 295 | | 300 | |
| Lys Lys Tyr Phe Val Ala Pro Thr Glu Asn Arg His Thr Val Glu Leu | | | | | | |
| | 305 | | 310 | | 315 | 320 |
| His His Leu Leu Leu Arg Gln His Pro His Gln His Pro Val Ala Arg | | | | | | |
| | 325 | | 330 | | 335 | |
| Ile Met Thr Gln Ile Lys Asn Arg Ile Thr Glu His Pro Arg Asn Gln | | | | | | |
| | 340 | | 345 | | 350 | |
| Cys Arg Lys Arg Leu Gly Arg Asn Asp Thr Val | | | | | | |
| | 355 | | 360 | | | |

<210> 1723

<211> 1095

<212> DNA

<213> Neisseria meningitidis

<400> 1723

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accctgctta tcattgacgt taacctgatt gatgcccggc aggttaatct cggcagggtc 180
ttccgcggtt gcaatattta ccgactccgt attcaaaata ttcaaacagg tatagagcga 240
caccgtctta cccgaacccg tcggaccggt taccagcacc atcccgtagg gacggtgaat 300
cgcttccaac aacaattttt tctgaaacgg ctcaaaacccg agctgggtcga tgttcaaaga 360
cgcggtcatcg gaattcaaaa tccgcatcac gaccttttcg ccaaacagcg tcggcaatgt 420
gctgacacgg aaatcgacag gcttgccgcc cttttgaaag gtcagctgca tcctgccgtc 480
ctgcggtatc cgtttttcgg aaatgtccaa acgcgcacatt accttaatcc gggaagcaag 540

```

```

ctgccccctt accgcaatgg gcggctgaac cacctcgcg agctgcccgt ccacacggaa 600
acggatacgg gcattgtgtt cgtaaaactc gaaatggatg tccgatgccc cgctgcgcaa 660
ggcatccgac aaagtcttat ggataaacct cggaacaggg ccgtcttctg cctcctcggt 720
gtcgatatac aggggtgtggc tttcctcttc ctctgcccc tccccaagct cctgaagcag 780
cgatgtcgaa cgcgaaccca cccaatcgag caaacccgcc aactgggtcat cctcgacaat 840
gaccaactca acctcaatcc ctgcggcaga aacggttttc tgaatttgcg gcattctgtg 900
cggatcggaa accgcaaaaa atactttgtc gccccgacgg aaaaccggca cacagtggaa 960
ctccaccatc tgctcctccg tcaacacccc catcagcacc ctgtggcgcg gataatgacg 1020
caaatcaaga atcgaataac tgaacaccct cgcaatcaat gccgcaagcg acttgggcga 1080
aatgacaccg tctga                                     1095

```

<210> 1724

<211> 364

<212> PRT

<213> *Neisseria meningitidis*

<400> 1724

```

Met Pro Cys Leu Cys Arg Leu Asn Arg Asn Ile Gly Ser Phe Gln Ile
  1             5             10             15

```

```

Thr Asn Leu Thr Asp His Asn Asp Val Arg Val Leu Thr Gln Glu Arg
      20             25             30

```

```

Leu Gln Ser Ser Gly Lys Ser Gln Thr Leu Leu Ile Ile Asp Val Asn
      35             40             45

```

```

Leu Ile Asp Ala Arg Gln Val Asn Leu Gly Arg Val Phe Arg Arg Cys
      50             55             60

```

```

Asn Ile Tyr Arg Leu Arg Ile Gln Asn Ile Gln Thr Gly Ile Glu Arg
      65             70             75             80

```

```

His Arg Leu Thr Arg Thr Arg Arg Thr Gly Tyr Gln His His Pro Val
      85             90             95

```

```

Gly Thr Val Asn Arg Phe Gln Gln Gln Phe Phe Leu Lys Arg Leu Lys
      100            105            110

```

```

Thr Glu Leu Val Asp Val Gln Arg Arg Gly Ile Gly Ile Gln Asn Pro
      115            120            125

```

```

His His Asp Leu Phe Ala Lys Gln Arg Arg Gln Cys Ala Asp Thr Glu
      130            135            140

```

```

Ile Asp Arg Leu Ala Ala Leu Leu Lys Gly Gln Leu His Pro Ala Val
      145            150            155            160

```

```

Leu Arg Tyr Pro Phe Phe Gly Asn Val Gln Thr Arg His Tyr Leu Asn
      165            170            175

```

```

Pro Gly Ser Lys Leu Pro Pro Tyr Arg Asn Gly Arg Leu Asn His Leu
      180            185            190

```

```

Ala Glu Leu Pro Val His Thr Glu Thr Asp Thr Gly Ile Val Phe Val
      195            200            205

```

Lys Leu Glu Met Asp Val Arg Cys Pro Ala Ala Gln Gly Ile Arg Gln
210 215 220

Ser Leu Met Asp Lys Pro Arg Asn Arg Ala Val Phe Cys Leu Leu Val
225 230 235 240

Val Asp Ile Gln Gly Val Ala Phe Leu Phe Leu Leu Pro Leu Pro Lys
245 250 255

Leu Leu Lys Gln Arg Cys Arg Thr Arg Thr His Pro Ile Glu Gln Thr
260 265 270

Arg Gln Leu Val Ile Leu Asp Asn Asp Gln Leu Asn Leu Asn Pro Cys
275 280 285

Gly Arg Asn Gly Phe Leu Asn Leu Arg His Leu Cys Arg Ile Gly Asn
290 295 300

Arg Lys Lys Tyr Phe Val Ala Pro Thr Glu Asn Arg His Thr Val Glu
305 310 315 320

Leu His His Leu Leu Leu Arg Gln His Pro His Gln His Pro Val Ala
325 330 335

Arg Ile Met Thr Gln Ile Lys Asn Arg Ile Thr Glu His Pro Arg Asn
340 345 350

Gln Cys Arg Lys Arg Leu Gly Arg Asn Asp Thr Val
355 360

<210> 1725

<211> 1209

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1725

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gtggatatga aaaccgtatt gaagcaggca aaaagcatcc cttcgggatt ttataaaagc 180
ctggacgctt tggtcgaccg caacagcggg cgcgcgga gggagttggc ggaagtcgtc 240
gacggccggc cgcaatcgta tgatttgaac cttaccctcg gcaaacttta ccgtcagcgc 300
ggcgaaaacg acaaagccat caacatacac cggacaatgc tcgattctcc cgatacggtc 360
ggcgaaaagc gcgcgcgcgt cctgtttgaa ttggcgcaaa actaccaaag cgcgggtttg 420
gtcgatcgty ccgaacagat ttttttggg ctgcaagacg gtgaaatggc gcgtgaagcc 480
agacagcacc tgctcaatat ctaccagcag gacagggatt gggaaaaagc ggttgaaacc 540
gccccacttc ttagtcacga cgaacagaca tatcagtttg agattgcaca gttttattgc 600
gaacttgccc aagccgcgct gttcaagtcc aatttcgatg ccgcgcggtt caatgtcggc 660
aaggcactcg aagccaacaa aaaatgcacc cgcgccaaca tgattttggg cgacattgaa 720
caccgacaag gcaatttccc tgccgccgtc gaagcctatg ccgccatcga gcagcaaac 780
catgcatact tgagcatggt cggcgagaag ctttacgaag cctatgccgc gcagggaaaa 840
cctgaagaag gcttgaaccg tctgacagga tatatgcaga cgtttcccga acttgacctg 900
atcaatgtcg tgtacgagaa atccctgctg ctttaagggcg agaaagaagc cgcgcaaac 960
gccgtcgagc ttgtccgccg caagcccagc cttaacggcg tgtaccgcct gtcggtttg 1020
aaactcagcg atttgatcc ggcttggaag gccgatgccg acatgatgcg ttcggttatc 1080
ggacgpcagc tccagcgcag cgtgatgtac cgttgccgca actgccactt caaatcccaa 1140

gtcttttttct ggcactgtcc cgcctgcaac aaatggcaga cgtttacgcc gaataaaaatc 1200
gaagtttaa 1209

<210> 1726
<211> 402
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1726
Met Leu Pro Asn Leu Pro Asn Ser Leu Lys Lys Ala Asp Met Asp Asn
1 5 10 15
Glu Leu Trp Ile Ile Leu Leu Pro Ile Ile Leu Leu Pro Val Phe Phe
20 25 30
Thr Met Gly Trp Phe Ala Ala Arg Val Asp Met Lys Thr Val Leu Lys
35 40 45
Gln Ala Lys Ser Ile Pro Ser Gly Phe Tyr Lys Ser Leu Asp Ala Leu
50 55 60
Val Asp Arg Asn Ser Gly Arg Ala Ala Arg Glu Leu Ala Glu Val Val
65 70 75 80
Asp Gly Arg Pro Gln Ser Tyr Asp Leu Asn Leu Thr Leu Gly Lys Leu
85 90 95
Tyr Arg Gln Arg Gly Glu Asn Asp Lys Ala Ile Asn Ile His Arg Thr
100 105 110
Met Leu Asp Ser Pro Asp Thr Val Gly Glu Lys Arg Ala Arg Val Leu
115 120 125
Phe Glu Leu Ala Gln Asn Tyr Gln Ser Ala Gly Leu Val Asp Arg Ala
130 135 140
Glu Gln Ile Phe Leu Gly Leu Gln Asp Gly Glu Met Ala Arg Glu Ala
145 150 155 160
Arg Gln His Leu Leu Asn Ile Tyr Gln Gln Asp Arg Asp Trp Glu Lys
165 170 175
Ala Val Glu Thr Ala Gln Leu Leu Ser His Asp Glu Gln Thr Tyr Gln
180 185 190
Phe Glu Ile Ala Gln Phe Tyr Cys Glu Leu Ala Gln Ala Ala Leu Phe
195 200 205
Lys Ser Asn Phe Asp Ala Ala Arg Phe Asn Val Gly Lys Ala Leu Glu
210 215 220
Ala Asn Lys Lys Cys Thr Arg Ala Asn Met Ile Leu Gly Asp Ile Glu
225 230 235 240
His Arg Gln Gly Asn Phe Pro Ala Ala Val Glu Ala Tyr Ala Ala Ile
245 250 255

Glu Gln Gln Asn His Ala Tyr Leu Ser Met Val Gly Glu Lys Leu Tyr
 260 265 270
 Glu Ala Tyr Ala Ala Gln Gly Lys Pro Glu Glu Gly Leu Asn Arg Leu
 275 280 285
 Thr Gly Tyr Met Gln Thr Phe Pro Glu Leu Asp Leu Ile Asn Val Val
 290 295 300
 Tyr Glu Lys Ser Leu Leu Leu Lys Gly Glu Lys Glu Ala Ala Gln Thr
 305 310 315 320
 Ala Val Glu Leu Val Arg Arg Lys Pro Asp Leu Asn Gly Val Tyr Arg
 325 330 335
 Leu Leu Gly Leu Lys Leu Ser Asp Leu Asp Pro Ala Trp Lys Ala Asp
 340 345 350
 Ala Asp Met Met Arg Ser Val Ile Gly Arg Gln Leu Gln Arg Ser Val
 355 360 365
 Met Tyr Arg Cys Arg Asn Cys His Phe Lys Ser Gln Val Phe Phe Trp
 370 375 380
 His Cys Pro Ala Cys Asn Lys Trp Gln Thr Phe Thr Pro Asn Lys Ile
 385 390 395 400
 Glu Val

<210> 1727

<211> 1209

<212> DNA

<213> Neisseria meningitidis

<400> 1727

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 atcctgctgc cgattatcct ttgcccgtc ttcttcgcga tgggctgggt tgccgccccgc 120
 gtggatatga aaaccgtatt gaagcaggca aaaagcatcc cttcggggatt ttataaaagc 180
 ttggacgctt tggtcgaccg caacagcggg cgcgcgga gggagttggc ggaagtcgctc 240
 gacggccggc cgcaatcgta tgatttgaac ctcaccctcg gcaaaacttta ccgccagcgt 300
 ggcgaaaacg acaaagccat caacatacac cggacaatgc tcgattctcc cgatacggtc 360
 ggcgaaaagc gcgcgcgcgt cctgtttgaa ttggcgcaaa actaccaaag tgcgggggttg 420
 gtcgatcgtg ccgaacagat ttttttggg ctgcaagacg gtaaaatggc gcgtgaagcc 480
 agacagcacc tgctcaatat ctaccaacag gacagggtt gggaaaaagc ggttgaaacc 540
 gcccggtcgc tcagccatga cgatcagacc tatcagtttg aaatcgccca gttttattgc 600
 gaacttgccc aagccgcgct gttcaagtcc aatttcgatg tcgcgcggtt caatgtcggc 660
 aaggcatcg aagccaacaa aaaatgcacc cgcgccaaca tgattttggg cgacatcgaa 720
 caccgacaag gcaatttccc tgccgcgctc gaagcctatg ccgccatcga gcagcaaac 780
 catgcatact tgagcatggt cggcgagaag ctttacgaag cctatgccgc gcagggaaaa 840
 cctgaagaag gcttgaaccg tctgacagga tatatgcaga cgtttcccga acttgacctg 900
 atcaatgtcg tgtacgagaa atccctgctg cttaagtgcg agaaagaagc cgcgcaaac 960
 gcgctcgagc ttgtccgccc caagcccagc cttaacggcg tgtaccgcct gctcggtttg 1020
 aaactcagcg atatgaatcc ggcttggaag gccgatgccg acatgatgcg ttcggttatc 1080
 ggacggcagc tacagcgcag cgtgatgtac cgttgccgca actgccactt caaatcccaa 1140

gtctttttct. ggcactgccc cgcctgcaac aaatggcaga cgtttacccc gaataaaatc 1200
gaagtttaa 1209

<210> 1728

<211> 402

<212> PRT

<213> Neisseria meningitidis

<400> 1728

Met Arg Pro Asn Leu Pro Asn Ser Leu Lys Lys Ala Asp Met Asp Asn
1 5 10 15

Glu Leu Trp Ile Ile Leu Leu Pro Ile Ile Leu Leu Pro Val Phe Phe
20 25 30

Ala Met Gly Trp Phe Ala Ala Arg Val Asp Met Lys Thr Val Leu Lys
35 40 45

Gln Ala Lys Ser Ile Pro Ser Gly Phe Tyr Lys Ser Leu Asp Ala Leu
50 55 60

Val Asp Arg Asn Ser Gly Arg Ala Ala Arg Glu Leu Ala Glu Val Val
65 70 75 80

Asp Gly Arg Pro Gln Ser Tyr Asp Leu Asn Leu Thr Leu Gly Lys Leu
85 90 95

Tyr Arg Gln Arg Gly Glu Asn Asp Lys Ala Ile Asn Ile His Arg Thr
100 105 110

Met Leu Asp Ser Pro Asp Thr Val Gly Glu Lys Arg Ala Arg Val Leu
115 120 125

Phe Glu Leu Ala Gln Asn Tyr Gln Ser Ala Gly Leu Val Asp Arg Ala
130 135 140

Glu Gln Ile Phe Leu Gly Leu Gln Asp Gly Lys Met Ala Arg Glu Ala
145 150 155 160

Arg Gln His Leu Leu Asn Ile Tyr Gln Gln Asp Arg Asp Trp Glu Lys
165 170 175

Ala Val Glu Thr Ala Arg Leu Leu Ser His Asp Asp Gln Thr Tyr Gln
180 185 190

Phe Glu Ile Ala Gln Phe Tyr Cys Glu Leu Ala Gln Ala Ala Leu Phe
195 200 205

Lys Ser Asn Phe Asp Val Ala Arg Phe Asn Val Gly Lys Ala Leu Glu
210 215 220

Ala Asn Lys Lys Cys Thr Arg Ala Asn Met Ile Leu Gly Asp Ile Glu
225 230 235 240

His Arg Gln Gly Asn Phe Pro Ala Ala Val Glu Ala Tyr Ala Ala Ile
245 250 255

Glu Gln Gln Asn His Ala Tyr Leu Ser Met Val Gly Glu Lys Leu Tyr
 260 265 270
 Glu Ala Tyr Ala Ala Gln Gly Lys Pro Glu Glu Gly Leu Asn Arg Leu
 275 280 285
 Thr Gly Tyr Met Gln Thr Phe Pro Glu Leu Asp Leu Ile Asn Val Val
 290 295 300
 Tyr Glu Lys Ser Leu Leu Leu Lys Cys Glu Lys Glu Ala Ala Gln Thr
 305 310 315 320
 Ala Val Glu Leu Val Arg Arg Lys Pro Asp Leu Asn Gly Val Tyr Arg
 325 330 335
 Leu Leu Gly Leu Lys Leu Ser Asp Met Asn Pro Ala Trp Lys Ala Asp
 340 345 350
 Ala Asp Met Met Arg Ser Val Ile Gly Arg Gln Leu Gln Arg Ser Val
 355 360 365
 Met Tyr Arg Cys Arg Asn Cys His Phe Lys Ser Gln Val Phe Phe Trp
 370 375 380
 His Cys Pro Ala Cys Asn Lys Trp Gln Thr Phe Thr Pro Asn Lys Ile
 385 390 395 400
 Glu Val

<210> 1729
 <211> 1209
 <212> DNA
 <213> Neisseria meningitidis

<400> 1729
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 atcctgctgc cgattatcct ttgcccgtt ttcttcgcga tgggctggtt tgccgcccgc 120
 gtggatatga agactgtatt aaagcaggca aaaagcatac cgtcgggatt ttataaaagt 180
 ctggatgcct tgggtgaccg caacagcggg cgcgcggcaa gggagttggc ggaagtcgtc 240
 gacggccggc cgcaatcgta tgatttgaac ctcaccctcg gcaaacttta ccgccagcgt 300
 ggcgaaaacg acaaagccat caatatgcac caaacattgc ttgactctcc cgatacaacc 360
 ggagccaagc gcgcgcgcgt cctgtttgaa ttggcgcaaa actaccaaag tgcgggggtg 420
 gtcgatcgtg ccgaacagat ttttttgggg ctgcaagacg gtgaaatggc gcgtgaagcc 480
 agacagcacc tgctcaatat ctaccaacag gacagggatt gggaaaaaagc ggttgaaacc 540
 gcccggtcgc tcagccatga cgatcagacc tatcagtttg aaatcgccca gttttattgc 600
 gaacttgccc aagccgcgct gttcaagtcc aatttcgatg ccgcgcggtt caatgtcggc 660
 aaggcactcg aagccaacaa aaaatgcacc cgcgccaaca tgattttggg cgacatcgaa 720
 caccgacaag gcaatttccc tgccgcgcgt gaagcctatg ccgccatcga gcagcaaac 780
 catgcatact tgagtatggt cggcgagaag ctttacgaag cctatgccgc gcagggaaaa 840
 cctgaagaag gcttgaaccg tctgacagga tatatgcaga cgtttcccga acttgacctg 900
 atcaatgtcg tgtacgagaa atccctgctg cttaagtgcg agaaagaagc cgcgcaaac 960
 gccgtcagac ttgtccgccg caagcccgc ctcaacggcg tgtaccgcct gcttggtttg 1020
 aaactcagcg atttgatcc ggcttgaaa gccgatgccg atatgatgcg ttcggttatc 1080
 ggacggcagc tacagcgagc cgtgatgtac cggtgccgaa actgccactt caaatcacia 1140

gtcttttttct ggcattgtcc tgcctgcaac aaatggcaga cgtttacgcc aaacaaaatc 1200
gaagtttaa 1209

<210> 1730
<211> 402
<212> PRT
<213> Neisseria meningitidis

<400> 1730
Met Arg Pro Asn Leu Pro Asn Ser Leu Glu Lys Ala Asp Met Asp Asn
1 5 10 15
Glu Leu Trp Ile Ile Leu Leu Pro Ile Ile Leu Leu Pro Val Phe Phe
20 25 30
Ala Met Gly Trp Phe Ala Ala Arg Val Asp Met Lys Thr Val Leu Lys
35 40 45
Gln Ala Lys Ser Ile Pro Ser Gly Phe Tyr Lys Ser Leu Asp Ala Leu
50 55 60
Val Asp Arg Asn Ser Gly Arg Ala Ala Arg Glu Leu Ala Glu Val Val
65 70 75 80
Asp Gly Arg Pro Gln Ser Tyr Asp Leu Asn Leu Thr Leu Gly Lys Leu
85 90 95
Tyr Arg Gln Arg Gly Glu Asn Asp Lys Ala Ile Asn Met His Gln Thr
100 105 110
Leu Leu Asp Ser Pro Asp Thr Thr Gly Ala Lys Arg Ala Arg Val Leu
115 120 125
Phe Glu Leu Ala Gln Asn Tyr Gln Ser Ala Gly Leu Val Asp Arg Ala
130 135 140
Glu Gln Ile Phe Leu Gly Leu Gln Asp Gly Glu Met Ala Arg Glu Ala
145 150 155 160
Arg Gln His Leu Leu Asn Ile Tyr Gln Gln Asp Arg Asp Trp Glu Lys
165 170 175
Ala Val Glu Thr Ala Arg Leu Leu Ser His Asp Asp Gln Thr Tyr Gln
180 185 190
Phe Glu Ile Ala Gln Phe Tyr Cys Glu Leu Ala Gln Ala Ala Leu Phe
195 200 205
Lys Ser Asn Phe Asp Ala Ala Arg Phe Asn Val Gly Lys Ala Leu Glu
210 215 220
Ala Asn Lys Lys Cys Thr Arg Ala Asn Met Ile Leu Gly Asp Ile Glu
225 230 235 240
His Arg Gln Gly Asn Phe Pro Ala Ala Val Glu Ala Tyr Ala Ala Ile
245 250 255

Glu Gln Gln Asn His Ala Tyr Leu Ser Met Val Gly Glu Lys Leu Tyr
 260 265 270
 Glu Ala Tyr Ala Ala Gln Gly Lys Pro Glu Glu Gly Leu Asn Arg Leu
 275 280 285
 Thr Gly Tyr Met Gln Thr Phe Pro Glu Leu Asp Leu Ile Asn Val Val
 290 295 300
 Tyr Glu Lys Ser Leu Leu Leu Lys Cys Glu Lys Glu Ala Ala Gln Thr
 305 310 315 320
 Ala Val Glu Leu Val Arg Arg Lys Pro Asp Leu Asn Gly Val Tyr Arg
 325 330 335
 Leu Leu Gly Leu Lys Leu Ser Asp Leu Asp Pro Ala Trp Lys Ala Asp
 340 345 350
 Ala Asp Met Met Arg Ser Val Ile Gly Arg Gln Leu Gln Arg Ser Val
 355 360 365
 Met Tyr Arg Cys Arg Asn Cys His Phe Lys Ser Gln Val Phe Phe Trp
 370 375 380
 His Cys Pro Ala Cys Asn Lys Trp Gln Thr Phe Thr Pro Asn Lys Ile
 385 390 395 400
 Glu Val

<210> 1731
 <211> 561
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1731
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 gtccgctttc ggtttcttct tcggcagaaa cctgttcgac aggttcggca acgggttcgg 120
 cggcaacttc actggctgtt tccgcaacag gttcggaaac ggtgttaccg gtttcgtcgg 180
 tcggcgtgtc gatggcagaa gcggcggctt cttggggggg cggattcggc agcggtttcc 240
 gatgcggcag tatttgcagc ggttacaggt ccgggttggc gttctgtcgc cgaagccgga 300
 gtttcggaca ctgcgggttt ggttcgggt cgaacggccg gtttttcgc ttttgcttcg 360
 ggcgcggcaa cttttgcttc aggtttttca accggttttt cgacaggttt ctctatcggg 420
 ttctccacag ttgcctgttt ggacggttca gacggcatgg atgcagtttc ggctttgggt 480
 ttccgccgtt gcggtttggg ttgttccgct ttgatttttt tgggtgctgc cgctttgatc 540
 ctgttcagat tcggaatgtg a 561

<210> 1732
 <211> 186
 <212> PRT
 <213> *Neisseria gonorrhoeae*

<400> 1732
 Met Pro Cys Leu Arg Arg Gln Ala Ala Arg Cys Thr Asn Arg Arg Thr

| | | | |
|---|-----|-----|-----|
| 1 | 5 | 10 | 15 |
| Asp Arg Gln Thr Val Arg Phe Arg Phe Leu Leu Arg Gln Lys Pro Val | | | |
| 20 | | 25 | 30 |
| Arg Gln Val Arg Gln Arg Val Arg Arg Gln Leu His Trp Leu Phe Pro | | | |
| 35 | 40 | 45 | |
| Gln Gln Val Arg Lys Arg Cys Tyr Arg Phe Arg Arg Ser Ala Cys Arg | | | |
| 50 | 55 | 60 | |
| Trp Gln Lys Arg Arg Leu Leu Gly Gly Ala Asp Ser Ala Ala Val Ser | | | |
| 65 | 70 | 75 | 80 |
| Asp Ala Ala Val Phe Ala Ala Gly Thr Gly Pro Gly Trp Arg Ser Val | | | |
| 85 | 90 | 95 | |
| Ala Glu Ala Gly Val Ser Asp Thr Ala Gly Leu Gly Ser Gly Arg Thr | | | |
| 100 | 105 | 110 | |
| Ala Gly Phe Ser Ala Phe Ala Ser Gly Ala Ala Thr Phe Ala Ser Gly | | | |
| 115 | 120 | 125 | |
| Phe Ser Thr Gly Phe Ser Thr Gly Phe Ser Ile Gly Phe Ser Thr Val | | | |
| 130 | 135 | 140 | |
| Ala Cys Leu Asp Gly Ser Asp Gly Met Asp Ala Val Ser Ala Leu Gly | | | |
| 145 | 150 | 155 | 160 |
| Phe Ala Val Cys Gly Leu Gly Cys Ser Ala Leu Ile Phe Leu Gly Ala | | | |
| 165 | 170 | 175 | |
| Ala Ala Leu Ile Leu Phe Arg Phe Gly Met | | | |
| 180 | 185 | | |

<210> 1733

<211> 1035

<212> DNA

<213> Neisseria meningitidis

<400> 1733

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atggtttcgg gcgaggaagc cttcaggaag cctgccagtc cggaggggtga ggcaggtttt 60
gcggaagctg tttcttctgt gccgatatgg ttgtttgagg gcaggttgtc ggagaaatcg 120
gtatcgacgg tttccggttt gttttcggca gtttgggcga cagattccgg ttcgggctgt 180
tcgatgacga tttcgacagg gttgtacggg ttgaaggctc cgggctcgta cacgctgtct 240
gtggattcga tggcgttcca atcggcatcc gcgcgttttt gggtttcttc atcctgcgta 300
agtgcgcggg ataaaatgcc gttttgcgcg gctgccaggc tgtcgaaatc caagtcatg 360
cggttggaag gcgtatcggg ttcgacatcg aacgtttgtt ttgccgataa ctcttcttca 420
gattcccat ctaaggcaag tgtgtcgttt acatcgtttt tcggagcggg ttcgggctgt 480
gccggagttt cgacttcggc aaaggtgatt tctatgccgt cgtctgccgc gtcgtcaagg 540
tcaggctctt cctcagggac ggattcttcg gtacggcgcg cgcgtttgga ttgggcaagg 600
cgcaaaagca gcagcagggc gattaatgcc gcgcctccgc cggcaagcag caaggtgtac 660
gaaccgccga acagaccgtc aaacagtccg ctttcgggtt cttcttcggc agaaacctgt 720
tcgacagggt cggaacggc gttaccggtt tcgtcggtcg gcgtgtcgat ggcagaagcg 780
gcggcttctt ggggggcgga ttcggcagcg gtttccgatg cggcagtatt tgcagcgggt 840
acaggttcgg gtcgaacggc cggtttttcc gcttttgctt cgggcgcggc aacttttgct 900

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tcagggttttt caaccgggttt ctctaccggtt gcctgttttg acgggttcgga cggcatggat 960
 gcgggtttcgg ctttgggttt cgccgtttgc ggtttgggtt gttccgcttt gatcctgttc 1020
 agattcggaa tgtga 1035

<210> 1734
 <211> 344
 <212> PRT
 <213> Neisseria meningitidis

<400> 1734
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 Glu Ala Gly Phe Ala Glu Ala Val Ser Ser Val Pro Ile Trp Leu Phe
 20 25 30
 Glu Gly Arg Leu Ser Glu Lys Ser Val Ser Thr Val Ser Gly Leu Phe
 35 40 45
 Ser Ala Val Trp Ala Thr Asp Ser Gly Ser Gly Val Ser Met Thr Ile
 50 55 60
 Ser Thr Gly Leu Tyr Gly Leu Lys Val Ser Gly Ser Tyr Thr Leu Ser
 65 70 75 80
 Val Asp Ser Met Ala Phe Gln Ser Ala Ser Ala Arg Phe Trp Val Ser
 85 90 95
 Ser Ser Cys Val Ser Ala Pro Asp Lys Met Pro Phe Cys Ala Ala Ala
 100 105 110
 Arg Leu Ser Lys Ser Lys Ser Met Arg Leu Glu Gly Val Ser Val Ser
 115 120 125
 Thr Ser Asn Val Cys Phe Ala Asp Asn Ser Ser Ser Asp Ser Pro Ser
 130 135 140
 Lys Ala Ser Val Ser Phe Thr Ser Phe Phe Gly Ala Gly Ser Gly Val
 145 150 155 160
 Ala Gly Val Ser Thr Ser Ala Lys Val Ile Ser Met Pro Ser Ser Ala
 165 170 175
 Ala Ser Ser Arg Ser Gly Ser Ser Ser Gly Thr Asp Ser Ser Val Arg
 180 185 190
 Arg Ala Arg Leu Asp Trp Ala Arg Arg Lys Ser Ser Ser Arg Ala Ile
 195 200 205
 Asn Ala Ala Pro Pro Pro Ala Ser Ser Lys Val Tyr Glu Pro Pro Asn
 210 215 220
 Arg Pro Ser Asn Ser Pro Leu Ser Val Ser Ser Ser Ala Glu Thr Cys
 225 230 235 240
 Ser Thr Gly Ser Glu Thr Ala Leu Pro Val Ser Ser Val Gly Val Ser

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 245 | | 250 | | 255 | | | | | | | | | | |
| Met | Ala | Glu | Ala | Ala | Ala | Ser | Trp | Gly | Ala | Asp | Ser | Ala | Ala | Val | Ser |
| | 260 | | | | | | | 265 | | | | | 270 | | |
| Asp | Ala | Ala | Val | Phe | Ala | Ala | Gly | Thr | Gly | Ser | Gly | Arg | Thr | Ala | Gly |
| | 275 | | | | | | 280 | | | | | 285 | | | |
| Phe | Ser | Ala | Phe | Ala | Ser | Gly | Ala | Ala | Thr | Phe | Ala | Ser | Gly | Phe | Ser |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Thr | Gly | Phe | Ser | Thr | Val | Ala | Cys | Leu | Asp | Gly | Ser | Asp | Gly | Met | Asp |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Ala | Val | Ser | Ala | Leu | Gly | Phe | Ala | Val | Cys | Gly | Leu | Gly | Cys | Ser | Ala |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Leu | Ile | Leu | Phe | Arg | Phe | Gly | Met | | | | | | | | |
| | | | | 340 | | | | | | | | | | | |

<210> 1735
 <211> 1023
 <212> DNA
 <213> Neisseria meningitidis

<400> 1735
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 gtatcgacgg tttccgggttt gttttcggca gtttgggcga cagattccgg ttcgggcggtg 180
 tcgatgacga tttcgacagg gttgtacggg ttgaaggctc cgggctcgta cacgtgtct 240
 gtggattcga tggcgttcca atcggcatcc gcgcgttttt gggtttcttc atcctgcgta 300
 agtgcgccgg ataaaatgcc gttttgcgcg gctgccaggc tgtcgaaatc caagtgcgatg 360
 cggttggaag gcgtatcggt ttcgacatcg aacgtttgtt ttgccgacaa ctcttcttca 420
 gattcccat ctaaggcaag tgtgtcgttt acatcgtttt tcggagcggg ttcgggcggt 480
 gccggagttt cgacttcggc aaagggtgatt tctatgccgt cgtctgccgc gtcgtcaagg 540
 tcaggctctt cctcagggac ggattcttcg gtacggcgcg cgcgtttgga ttgggcaagg 600
 cgcaaaagca gcagcagggc gatcaatgcc gcgcctccgc cggcaagcag caagggtgtac 660
 gaaccgccga acagtcgctt ttcggtttct tcttcggcag aaacctgttc gacagggttcg 720
 gaaacggcgt taccggtttc gtcggtcggc gtgtcgatgg cagaagcggc ggcttcttg 780
 ggggcggtt cggcagcggt ttcgatgcg gcagtatttg cagcgggtac aggttcgggt 840
 cgaacggccg gtttttcgcg ttttgcttcg ggcgcgga cttttgcttc aggtttttca 900
 accggtttct ctaccgttgc ctggttggtgac ggttcggacg gcatggatgc gggttcggct 960
 ttgggtttcg ccgtttgcgg tttgggttgt tccgctttga tcctgttcag attcggaatg 1020
 tga 1023

<210> 1736
 <211> 340
 <212> PRT
 <213> Neisseria meningitidis

<400> 1736
 Met Val Ser Gly Glu Glu Ala Phe Arg Lys Pro Ala Ser Pro Glu Gly
 1 5 10 15
 Glu Ala Gly Phe Ala Glu Ala Val Ser Ser Val Pro Ile Trp Leu Phe

| 20 | | | | | 25 | | | | | 30 | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Glu | Gly | Arg | Leu | Ser | Glu | Lys | Ser | Val | Ser | Thr | Val | Ser | Gly | Leu | Phe | |
| 35 | | | | | 40 | | | | | 45 | | | | | | |
| Ser | Ala | Val | Trp | Ala | Thr | Asp | Ser | Gly | Ser | Gly | Val | Ser | Met | Thr | Ile | |
| 50 | | | | | 55 | | | | | 60 | | | | | | |
| Ser | Thr | Gly | Leu | Tyr | Gly | Leu | Lys | Val | Ser | Gly | Ser | Tyr | Thr | Leu | Ser | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | |
| Val | Asp | Ser | Met | Ala | Phe | Gln | Ser | Ala | Ser | Ala | Arg | Phe | Trp | Val | Ser | |
| 85 | | | | | 90 | | | | | 95 | | | | | | |
| Ser | Ser | Cys | Val | Ser | Ala | Pro | Asp | Lys | Met | Pro | Phe | Cys | Ala | Ala | Ala | |
| 100 | | | | | 105 | | | | | 110 | | | | | | |
| Arg | Leu | Ser | Lys | Ser | Lys | Ser | Met | Arg | Leu | Glu | Gly | Val | Ser | Val | Ser | |
| 115 | | | | | 120 | | | | | 125 | | | | | | |
| Thr | Ser | Asn | Val | Cys | Phe | Ala | Asp | Asn | Ser | Ser | Ser | Asp | Ser | Pro | Ser | |
| 130 | | | | | 135 | | | | | 140 | | | | | | |
| Lys | Ala | Ser | Val | Ser | Phe | Thr | Ser | Phe | Phe | Gly | Ala | Gly | Ser | Gly | Val | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | |
| Ala | Gly | Val | Ser | Thr | Ser | Ala | Lys | Val | Ile | Ser | Met | Pro | Ser | Ser | Ala | |
| 165 | | | | | 170 | | | | | 175 | | | | | | |
| Ala | Ser | Ser | Arg | Ser | Gly | Ser | Ser | Ser | Gly | Thr | Asp | Ser | Ser | Val | Arg | |
| 180 | | | | | 185 | | | | | 190 | | | | | | |
| Arg | Ala | Arg | Leu | Asp | Trp | Ala | Arg | Arg | Lys | Ser | Ser | Ser | Arg | Ala | Ile | |
| 195 | | | | | 200 | | | | | 205 | | | | | | |
| Asn | Ala | Ala | Pro | Pro | Pro | Ala | Ser | Ser | Lys | Val | Tyr | Glu | Pro | Pro | Asn | |
| 210 | | | | | 215 | | | | | 220 | | | | | | |
| Ser | Pro | Leu | Ser | Val | Ser | Ser | Ser | Ala | Glu | Thr | Cys | Ser | Thr | Gly | Ser | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | |
| Glu | Thr | Ala | Leu | Pro | Val | Ser | Ser | Val | Gly | Val | Ser | Met | Ala | Glu | Ala | |
| 245 | | | | | 250 | | | | | 255 | | | | | | |
| Ala | Ala | Ser | Trp | Gly | Ala | Asp | Ser | Ala | Ala | Val | Ser | Asp | Ala | Ala | Val | |
| 260 | | | | | 265 | | | | | 270 | | | | | | |
| Phe | Ala | Ala | Gly | Thr | Gly | Ser | Gly | Arg | Thr | Ala | Gly | Phe | Ser | Ala | Phe | |
| 275 | | | | | 280 | | | | | 285 | | | | | | |
| Ala | Ser | Gly | Ala | Ala | Thr | Phe | Ala | Ser | Gly | Phe | Ser | Thr | Gly | Phe | Ser | |
| 290 | | | | | 295 | | | | | 300 | | | | | | |
| Thr | Val | Ala | Cys | Leu | Asp | Gly | Ser | Asp | Gly | Met | Asp | Ala | Val | Ser | Ala | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | |
| Leu | Gly | Phe | Ala | Val | Cys | Gly | Leu | Gly | Cys | Ser | Ala | Leu | Ile | Leu | Phe | |

325

330

335

Arg Phe Gly Met
340

<210> 1737

<211> 648

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1737

```

atgggcgtgg acatcggacg ctccctgaaa caaatgaagg aacagggcgc ggaaatcgat 60
ttgaaagtct ttaccgatgc catgcaggca gtgtatgacg gcaaagaaat caaaatgacc 120
gaagagcagg cccaggaagt gatgatgaaa ttcctgcagg agcagcaggc taaagccgta 180
gaaaaacaca aggcggatgc gaaggccaac aaagaaaaag gcgaagcctt cctgaaggaa 240
aatgccgccg aagacggcgt gaagaccact gcttcgggtc tgcagtacaa aatcaccaaa 300
cagggtgaag gcaaacagcc gacaaaagac gacatcgtaa ccgtggaata cgaaggccgc 360
ctgattgacg gtaccgtatt cgacagcagc aaagccaacg gcggcccggc caccttcctt 420
ttgagccaag tgattccggg ttggaccgaa ggcgtacggc ttctgaaaga aggcggcgaa 480
gccacgttct acatcccgtc caaccttgcc taccgcgaac aggggtgcggg cgaaaaaatc 540
ggtccgaacg ccactttggt atttgacgtg aaactgggtc aaatcggcgc acccgaaaac 600
gcgcccgcga agcagccgga tcaagtcgac atcaaaaaag taaattaa 648

```

<210> 1738

<211> 215

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1738

```

Met Gly Val Asp Ile Gly Arg Ser Leu Lys Gln Met Lys Glu Gln Gly
 1             5             10            15

Ala Glu Ile Asp Leu Lys Val Phe Thr Asp Ala Met Gln Ala Val Tyr
      20             25             30

Asp Gly Lys Glu Ile Lys Met Thr Glu Glu Gln Ala Gln Glu Val Met
      35             40             45

Met Lys Phe Leu Gln Glu Gln Gln Ala Lys Ala Val Glu Lys His Lys
      50             55             60

Ala Asp Ala Lys Ala Asn Lys Glu Lys Gly Glu Ala Phe Leu Lys Glu
      65             70             75             80

Asn Ala Ala Glu Asp Gly Val Lys Thr Thr Ala Ser Gly Leu Gln Tyr
      85             90             95

Lys Ile Thr Lys Gln Gly Glu Gly Lys Gln Pro Thr Lys Asp Asp Ile
      100            105            110

Val Thr Val Glu Tyr Glu Gly Arg Leu Ile Asp Gly Thr Val Phe Asp
      115            120            125

Ser Ser Lys Ala Asn Gly Gly Pro Ala Thr Phe Pro Leu Ser Gln Val
      130            135            140

```

Ile Pro Gly Trp Thr Glu Gly Val Arg Leu Leu Lys Glu Gly Gly Glu
 145 150 155 160

Ala Thr Phe Tyr Ile Pro Ser Asn Leu Ala Tyr Arg Glu Gln Gly Ala
 165 170 175

Gly Glu Lys Ile Gly Pro Asn Ala Thr Leu Val Phe Asp Val Lys Leu
 180 185 190

Val Lys Ile Gly Ala Pro Glu Asn Ala Pro Ala Lys Gln Pro Asp Gln
 195 200 205

Val Asp Ile Lys Lys Val Asn
 210 215

<210> 1739

<211> 669

<212> DNA

<213> Neisseria meningitidis

<400> 1739

atgcagcagg caagctatgc gatgggcgtg gacatcggac gctccctgaa gcaaatagaag 60
 gaacagggcg cggaaatcga tttgaaagtc tttaccgaag ccatgcaggc agtgtatgac 120
 ggcaaagaaa tcaaaatgac cgaagagcag gctcaggaag tcatgatgaa attccttcag 180
 gaacaacagg ctaaagccgt agaaaaacac aaggcggacg cgaaggccaa taaagaaaaa 240
 ggcgaaagcct ttctgaaaga aaatgccgcc aaagacggcg tgaagaccac tgcttcggcg 300
 ctgcaatata aaatcaccaa acagggcgaa ggcaaacagc cgaccaaaga cgacatcggt 360
 accgtggaat acgaaggccg cctgattgac ggtacgggtat tcgacagcag caaagccaac 420
 ggcgggcccg tcaccttccc tttgagccaa gtgattccgg gttggaccga aggcgtacag 480
 cttctgaaag aaggcggcga agccacgttc tacatcccggt ccaaccttgc ctaccgcgaa 540
 caggggtgcgg gcgacaaaat cggtcggaac gccactttgg tatttgatgt gaaactggtc 600
 aaaatcggcg caccgaaaaa cgcgcccgcc aagcagccgg ctcaagtcga catcaaaaaa 660
 gtaaattaa 669

<210> 1740

<211> 222

<212> PRT

<213> Neisseria meningitidis

<400> 1740

Met Gln Gln Ala Ser Tyr Ala Met Gly Val Asp Ile Gly Arg Ser Leu
 1 5 10 15

Lys Gln Met Lys Glu Gln Gly Ala Glu Ile Asp Leu Lys Val Phe Thr
 20 25 30

Glu Ala Met Gln Ala Val Tyr Asp Gly Lys Glu Ile Lys Met Thr Glu
 35 40 45

Glu Gln Ala Gln Glu Val Met Met Lys Phe Leu Gln Glu Gln Gln Ala
 50 55 60

Lys Ala Val Glu Lys His Lys Ala Asp Ala Lys Ala Asn Lys Glu Lys
 65 70 75 80

Gly Glu Ala Phe Leu Lys Glu Asn Ala Ala Lys Asp Gly Val Lys Thr
 85 90 95
 Thr Ala Ser Gly Leu Gln Tyr Lys Ile Thr Lys Gln Gly Glu Gly Lys
 100 105 110
 Gln Pro Thr Lys Asp Asp Ile Val Thr Val Glu Tyr Glu Gly Arg Leu
 115 120 125
 Ile Asp Gly Thr Val Phe Asp Ser Ser Lys Ala Asn Gly Gly Pro Val
 130 135 140
 Thr Phe Pro Leu Ser Gln Val Ile Pro Gly Trp Thr Glu Gly Val Gln
 145 150 155 160
 Leu Leu Lys Glu Gly Gly Glu Ala Thr Phe Tyr Ile Pro Ser Asn Leu
 165 170 175
 Ala Tyr Arg Glu Gln Gly Ala Gly Asp Lys Ile Gly Pro Asn Ala Thr
 180 185 190
 Leu Val Phe Asp Val Lys Leu Val Lys Ile Gly Ala Pro Glu Asn Ala
 195 200 205
 Pro Ala Lys Gln Pro Ala Gln Val Asp Ile Lys Lys Val Asn
 210 215 220

<210> 1741
 <211> 819
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1741
 atgaacacca ttttcaaaat cagcgccactg accctttccg ccgcttttggc actttccgcc 60
 tgcggcaaaa aagaagccgc ccccgcatct gcatccgaac ctgccgccgc ttcttccgcg 120
 cagggcgaca cctcttcgat cggcagcagc atgcagcagg caagctatgc gatgggcgtg 180
 gacatcggac gctccctgaa gcaaataaag gaacagggcg cggaaatcga ttgaaagtc 240
 tttaccgaag ccatgcaggc agtgtatgac ggcaaagaaa tcaaaatgac cgaagagcag 300
 gctcaggaag tcatgatgaa attccttcag gaacaacagg ctaaagccgt agaaaaacac 360
 aaggcggacg cgaaggccaa taaagaaaaa ggcgaaagcct ttctgaaaga aaatgccgcc 420
 aaagacggcg tgaagaccac tgcttccggc ctgcaataca aaatcaccaa acagggcgaa 480
 ggcaaacagc cgaccaaaga cgacatcggt accgtggaat acgaaggccg cctgattgac 540
 ggtacggtat tcgacagcag caaagccaac ggcggcccgc tcaccttccc tttagacca 600
 gtgattctgg gttggaccga aggcgtacag cttctgaaag aaggcggcga agccacgttc 660
 tacatcccggt ccaaccttgc ctaccgcgaa cagggtgcgg gcgacaaaat cggcccgaac 720
 gccactttgg tatattgatgt gaaactggtc aaaatcggcg cacccgaaaa cgcgcccgcc 780
 aagcagcccg ctcaagtcga catcaaaaaa gtaaattaa 819

<210> 1742
 <211> 272
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1742

Met Asn Thr Ile Phe Lys Ile Ser Ala Leu Thr Leu Ser Ala Ala Leu
1 5 10 15
Ala Leu Ser Ala Cys Gly Lys Lys Glu Ala Ala Pro Ala Ser Ala Ser
20 25 30
Glu Pro Ala Ala Ala Ser Ser Ala Gln Gly Asp Thr Ser Ser Ile Gly
35 40 45
Ser Thr Met Gln Gln Ala Ser Tyr Ala Met Gly Val Asp Ile Gly Arg
50 55 60
Ser Leu Lys Gln Met Lys Glu Gln Gly Ala Glu Ile Asp Leu Lys Val
65 70 75 80
Phe Thr Glu Ala Met Gln Ala Val Tyr Asp Gly Lys Glu Ile Lys Met
85 90 95
Thr Glu Glu Gln Ala Gln Glu Val Met Met Lys Phe Leu Gln Glu Gln
100 105 110
Gln Ala Lys Ala Val Glu Lys His Lys Ala Asp Ala Lys Ala Asn Lys
115 120 125
Glu Lys Gly Glu Ala Phe Leu Lys Glu Asn Ala Ala Lys Asp Gly Val
130 135 140
Lys Thr Thr Ala Ser Gly Leu Gln Tyr Lys Ile Thr Lys Gln Gly Glu
145 150 155 160
Gly Lys Gln Pro Thr Lys Asp Asp Ile Val Thr Val Glu Tyr Glu Gly
165 170 175
Arg Leu Ile Asp Gly Thr Val Phe Asp Ser Ser Lys Ala Asn Gly Gly
180 185 190
Pro Val Thr Phe Pro Leu Ser Gln Val Ile Leu Gly Trp Thr Glu Gly
195 200 205
Val Gln Leu Leu Lys Glu Gly Gly Glu Ala Thr Phe Tyr Ile Pro Ser
210 215 220
Asn Leu Ala Tyr Arg Glu Gln Gly Ala Gly Asp Lys Ile Gly Pro Asn
225 230 235 240
Ala Thr Leu Val Phe Asp Val Lys Leu Val Lys Ile Gly Ala Pro Glu
245 250 255
Asn Ala Pro Ala Lys Gln Pro Ala Gln Val Asp Ile Lys Lys Val Asn
260 265 270

<210> 1743

<211> 819

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1743

```
atgaacacca ttttcaaaat cagcgcactg acccttttcg ccgcttttggc actttccgcc 60
tgccggcaaaa aagaagccgc ccccgcatct gcatccgaac ctgccgccgc ttctgccgcg 120
cagggcgaca cctcttcaat cggcagcacg atgcagcagg caagctatgc aatgggcgtg 180
gacatcggac gctccctgaa acaaatgaag gaacagggcg cggaaatcga tttgaaagtc 240
tttaccgatg ccatgcaggc agtgtatgac ggcaaagaaa tcaaaatgac cgaagagcag 300
gcccaggaag tgatgatgaa attcctgcag gagcagcagg ctaaagccgt agaaaaacac 360
aaggcggatg cgaaggccaa caaagaaaaa ggcgaagcct tcctgaagga aaatgccgcc 420
aaagacggcg tgaagaccac tgcttccggt ctgcagtaca aaatcaccaa acagggtgaa 480
ggcaaacagc cgacaaaaga cgacatcggt accgtggaat acgaaggccg cctgattgac 540
ggtaccgtat tcgacagcag caaagccaac ggcggcccgg ccaccttccc tttgagccaa 600
gtgattccgg gttggaccga aggcgtacgg cttctgaaag aaggcggcga agccacgttc 660
tacatcccgt ccaaccttgc ctaccgcgaa cagggtgccg gcgaaaaaat cggtcggaac 720
gccactttgg tatttgacgt gaaactggtc aaaatcggcg cacccgaaaa cgcgcccgcc 780
aagcagccgg atcaagtcga catcaaaaaa gtaaattaa 819
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<210> 1744

<211> 272

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1744

```
Met Asn Thr Ile Phe Lys Ile Ser Ala Leu Thr Leu Ser Ala Ala Leu
 1             5             10             15

Ala Leu Ser Ala Cys Gly Lys Lys Glu Ala Ala Pro Ala Ser Ala Ser
 20             25             30

Glu Pro Ala Ala Ala Ser Ala Ala Gln Gly Asp Thr Ser Ser Ile Gly
 35             40             45

Ser Thr Met Gln Gln Ala Ser Tyr Ala Met Gly Val Asp Ile Gly Arg
 50             55             60

Ser Leu Lys Gln Met Lys Glu Gln Gly Ala Glu Ile Asp Leu Lys Val
 65             70             75             80

Phe Thr Asp Ala Met Gln Ala Val Tyr Asp Gly Lys Glu Ile Lys Met
 85             90             95

Thr Glu Glu Gln Ala Gln Glu Val Met Met Lys Phe Leu Gln Glu Gln
100            105            110

Gln Ala Lys Ala Val Glu Lys His Lys Ala Asp Ala Lys Ala Asn Lys
115            120            125

Glu Lys Gly Glu Ala Phe Leu Lys Glu Asn Ala Ala Lys Asp Gly Val
130            135            140

Lys Thr Thr Ala Ser Gly Leu Gln Tyr Lys Ile Thr Lys Gln Gly Glu
145            150            155            160
```

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Lys | Gln | Pro | Thr | Lys | Asp | Asp | Ile | Val | Thr | Val | Glu | Tyr | Glu | Gly |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Arg | Leu | Ile | Asp | Gly | Thr | Val | Phe | Asp | Ser | Ser | Lys | Ala | Asn | Gly | Gly |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Pro | Ala | Thr | Phe | Pro | Leu | Ser | Gln | Val | Ile | Pro | Gly | Trp | Thr | Glu | Gly |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Val | Arg | Leu | Leu | Lys | Glu | Gly | Gly | Glu | Ala | Thr | Phe | Tyr | Ile | Pro | Ser |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Asn | Leu | Ala | Tyr | Arg | Glu | Gln | Gly | Ala | Gly | Glu | Lys | Ile | Gly | Pro | Asn |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Ala | Thr | Leu | Val | Phe | Asp | Val | Lys | Leu | Val | Lys | Ile | Gly | Ala | Pro | Glu |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Asn | Ala | Pro | Ala | Lys | Gln | Pro | Asp | Gln | Val | Asp | Ile | Lys | Lys | Val | Asn |
| | | | 260 | | | | | 265 | | | | | 270 | | |

<210> 1745
 <211> 819
 <212> DNA
 <213> Neisseria meningitidis

<400> 1745
 atgaacacca ttttcaaaat cagcgcaactg acccttttcg cgcgttttggc acttttcgcgc 60
 tgcggcaaaa aagaagccgc ccccgcatct gcatccgaac ctgcgcgcgc ttcttcgcgc 120
 cagggcgaca cctcttcgat cggcagcagc atgcagcagg caagctatgc gatgggcgtg 180
 gacatcggac gctccctgaa gcaaataaag gaacagggcg cggaaatcga ttgaaagtc 240
 tttaccgaag ccatgcaggc agtgtatgac ggcaaagaaa tcaaaatgac cgaagagcag 300
 gctcaggaag tcatgatgaa attccttcag gaacaacagg ctaaagccgt agaaaaacac 360
 aaggcggacg cgaaggccaa taaagaaaaa ggcgaaagcct ttctgaaaga aaatgccgcc 420
 aaagacggcg tgaagaccac tgcttcggcg ctgcaataca aaatcaccaa acagggcgaa 480
 ggcaaacagc cgaccaaaaga cgacatcggt accgtggaat acgaaggccg cctgattgac 540
 ggtacgggtat tcgacagcag caaagccaac ggcgcccgcg tcaccttccc tttagccaa 600
 gtgattccgg gttggaccga aggcgtacag cttctgaaag aaggcggcga agccacgttc 660
 tacatcccgt ccaaccttgc ctaccgcgaa cagggtgcgc gcgacaaaat cgggccgaac 720
 gccactttgg tatttgatgt gaaactggc aaaatcggcg cacccgaaaa cgcgcccgcc 780
 aagcagccgg ctcaagtcga catcaaaaaa gttaaattaa 819

<210> 1746
 <211> 272
 <212> PRT
 <213> Neisseria meningitidis

<400> 1746
 Met Asn Thr Ile Phe Lys Ile Ser Ala Leu Thr Leu Ser Ala Ala Leu
 1 5 10 15

Ala Leu Ser Ala Cys Gly Lys Lys Glu Ala Ala Pro Ala Ser Ala Ser
 20 25 30
 Glu Pro Ala Ala Ala Ser Ser Ala Gln Gly Asp Thr Ser Ser Ile Gly
 35 40 45
 Ser Thr Met Gln Gln Ala Ser Tyr Ala Met Gly Val Asp Ile Gly Arg
 50 55 60
 Ser Leu Lys Gln Met Lys Glu Gln Gly Ala Glu Ile Asp Leu Lys Val
 65 70 75 80
 Phe Thr Glu Ala Met Gln Ala Val Tyr Asp Gly Lys Glu Ile Lys Met
 85 90 95
 Thr Glu Glu Gln Ala Gln Glu Val Met Met Lys Phe Leu Gln Glu Gln
 100 105 110
 Gln Ala Lys Ala Val Glu Lys His Lys Ala Asp Ala Lys Ala Asn Lys
 115 120 125
 Glu Lys Gly Glu Ala Phe Leu Lys Glu Asn Ala Ala Lys Asp Gly Val
 130 135 140
 Lys Thr Thr Ala Ser Gly Leu Gln Tyr Lys Ile Thr Lys Gln Gly Glu
 145 150 155 160
 Gly Lys Gln Pro Thr Lys Asp Asp Ile Val Thr Val Glu Tyr Glu Gly
 165 170 175
 Arg Leu Ile Asp Gly Thr Val Phe Asp Ser Ser Lys Ala Asn Gly Gly
 180 185 190
 Pro Val Thr Phe Pro Leu Ser Gln Val Ile Pro Gly Trp Thr Glu Gly
 195 200 205
 Val Gln Leu Leu Lys Glu Gly Gly Glu Ala Thr Phe Tyr Ile Pro Ser
 210 215 220
 Asn Leu Ala Tyr Arg Glu Gln Gly Ala Gly Asp Lys Ile Gly Pro Asn
 225 230 235 240
 Ala Thr Leu Val Phe Asp Val Lys Leu Val Lys Ile Gly Ala Pro Glu
 245 250 255
 Asn Ala Pro Ala Lys Gln Pro Ala Gln Val Asp Ile Lys Lys Val Asn
 260 265 270

<210> 1747

<211> 819

<212> DNA

<213> Neisseria meningitidis

<400> 1747

```
atgaacacca ttttcaaaat cagcgccactg accctttccg ccgctttggc actttccgcc 60
tgccggcaaaa aagaagccgc ccccgcatct gcatccgaac ctgccgccgc ttcttccgcg 120
cagggcgaca cctcttcgat cggcagcacg atgcagcagg caagctatgc gatgggcgtg 180
gacatcggac gctccctgaa gcaaatgaag gaacagggcg cggaaatcga tttgaaagtc 240
tttaccgaag ccatgcaggc agtgtatgac ggcaaagaaa tcaaaatgac cgaagagcag 300
gctcaggaag tcatgatgaa attccttcag gaacaacagg cttaaagccgt agaaaaaac 360
aaggcggacg cgaaggccaa taaagaaaaa ggcgaaagcct ttctgaaaga aaatgccgcc 420
aaagacggcg tgaagaccac tgcttccggc ctgcaatata aaatcaccaa acagggcgaa 480
ggcaaacagc cgaccaaaga cgacatcggt accgtggaat acgaaggccg cctgattgac 540
ggtacggtat tgcacagcag caaagccaac ggcggcccg tcaacctccc tttgagccaa 600
gtgattctgg gttggaccga aggcgtacag cttctgaaag aaggcggcga agccacgttc 660
tacatcccgt ccaaccttgc ctaccgcgaa cagggtgcgg gcgacaaaat cggcccgaac 720
gccactttgg tatttgatgt gaaactggtc aaaatcgcg cacccgaaaa cgcgcccgcc 780
aagcagccgg ctcaagtcga catcaaaaaa gtaaattaa 819
```

<210> 1748

<211> 272

<212> PRT

<213> Neisseria meningitidis

<400> 1748

```
Met Asn Thr Ile Phe Lys Ile Ser Ala Leu Thr Leu Ser Ala Ala Leu
  1              5              10              15

Ala Leu Ser Ala Cys Gly Lys Lys Glu Ala Ala Pro Ala Ser Ala Ser
      20              25              30

Glu Pro Ala Ala Ala Ser Ser Ala Gln Gly Asp Thr Ser Ser Ile Gly
      35              40              45

Ser Thr Met Gln Gln Ala Ser Tyr Ala Met Gly Val Asp Ile Gly Arg
      50              55              60

Ser Leu Lys Gln Met Lys Glu Gln Gly Ala Glu Ile Asp Leu Lys Val
      65              70              75              80

Phe Thr Glu Ala Met Gln Ala Val Tyr Asp Gly Lys Glu Ile Lys Met
      85              90              95

Thr Glu Glu Gln Ala Gln Glu Val Met Met Lys Phe Leu Gln Glu Gln
      100              105              110

Gln Ala Lys Ala Val Glu Lys His Lys Ala Asp Ala Lys Ala Asn Lys
      115              120              125

Glu Lys Gly Glu Ala Phe Leu Lys Glu Asn Ala Ala Lys Asp Gly Val
      130              135              140

Lys Thr Thr Ala Ser Gly Leu Gln Tyr Lys Ile Thr Lys Gln Gly Glu
      145              150              155              160

Gly Lys Gln Pro Thr Lys Asp Asp Ile Val Thr Val Glu Tyr Glu Gly
      165              170              175

Arg Leu Ile Asp Gly Thr Val Phe Asp Ser Ser Lys Ala Asn Gly Gly
```

| | | |
|---|-----|-----|
| 180 | 185 | 190 |
| Pro Val Thr Phe Pro Leu Ser Gln Val Ile Leu Gly Trp Thr Glu Gly | | |
| 195 | 200 | 205 |
| Val Gln Leu Leu Lys Glu Gly Gly Glu Ala Thr Phe Tyr Ile Pro Ser | | |
| 210 | 215 | 220 |
| Asn Leu Ala Tyr Arg Glu Gln Gly Ala Gly Asp Lys Ile Gly Pro Asn | | |
| 225 | 230 | 235 |
| Ala Thr Leu Val Phe Asp Val Lys Leu Val Lys Ile Gly Ala Pro Glu | | |
| | 245 | 250 |
| | | 255 |
| Asn Ala Pro Ala Lys Gln Pro Ala Gln Val Asp Ile Lys Lys Val Asn | | |
| 260 | 265 | 270 |

<210> 1749
 <211> 483
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1749
 atggaaagga gcggtgtatt tggtaaaatt gtcggcaatc gcatactccg tatgccgtcc 60
 gaacacgctg ccgcattcta tccgaaaccg tgcaaatcgt ttaaactaac gcaatcttgg 120
 ttcagagtgc gaagctgtcc gtgcggcggtt tttattttacg gagcaaaccat gaaacttatc 180
 tataccgtca tcaaaatcat tatcctgctg ctcttctctgc tgcttgccgt cattaatatg 240
 gatgccgtta ccttttctta tcttccgggg cagagtgtca atctgccgct gattgtcgta 300
 ttgttcggcg cgtttgtcgt cggcatcgtg ttcggaatgt ttgccctggt cgggcggctg 360
 ctgtccttgc gcggcgaaaa cagccgcctg cgtgcggaag tgaagaaaag tgcgcgcttg 420
 agcggacaga aattgactgc accgcccata caaaatgctg ccgaatctgc caaacagcct 480
 taa 483

<210> 1750
 <211> 160
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1750
 Met Glu Arg Ser Gly Val Phe Gly Lys Ile Val Gly Asn Arg Ile Leu
 1 5 10 15
 Arg Met Pro Ser Glu His Ala Ala Ala Phe Tyr Pro Lys Pro Cys Lys
 20 25 30
 Ser Phe Lys Leu Thr Gln Ser Trp Phe Arg Val Arg Ser Cys Pro Cys
 35 40 45
 Gly Val Phe Ile Tyr Gly Ala Asn Met Lys Leu Ile Tyr Thr Val Ile
 50 55 60
 Lys Ile Ile Ile Leu Leu Leu Phe Leu Leu Leu Ala Val Ile Asn Met

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 65 | | 70 | | 75 | | 80 | | | | | | | | | |
| Asp | Ala | Val | Thr | Phe | Ser | Tyr | Leu | Pro | Gly | Gln | Ser | Val | Asn | Leu | Pro |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Leu | Ile | Val | Val | Leu | Phe | Gly | Ala | Phe | Val | Val | Gly | Ile | Val | Phe | Gly |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Met | Phe | Ala | Leu | Phe | Gly | Arg | Leu | Leu | Ser | Leu | Arg | Gly | Glu | Asn | Ser |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Arg | Leu | Arg | Ala | Glu | Val | Lys | Lys | Ser | Ala | Arg | Leu | Ser | Gly | Gln | Lys |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Leu | Thr | Ala | Pro | Pro | Ile | Gln | Asn | Ala | Ala | Glu | Ser | Ala | Lys | Gln | Pro |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |

<210> 1751
 <211> 483
 <212> DNA
 <213> Neisseria meningitidis

<400> 1751
 atggaaagga acggtgtatt tggtaaaatt gtcggcaatc gcatactccg tatgtcgtcc 60
 gaacacgctg ccgcataccta tccgaaaccg tgcaaatcgt ttaaactagc gcaatcttgg 120
 ttcagagtgc gaagctgtct gggcggcggt tttatattac gagcaaacat gaaacttata 180
 tataccgtca tcaaaatcat tatcctgctg ctcttcctgc tgcttgccgt cattaatacg 240
 gatgccgtta ccttttccta cctgccgggg caaaaattcg atttgccgct gattgtcgta 300
 ttgttcggcg cattttagt cggtattatt tttggaatgt ttgccttggt cggacggttg 360
 ttgtcgttac gtggcgagaa cggcaggttg cgtgccgaag taaagaaaaa tgcgcgtttg 420
 acggggaagg agctgaccgc accaccggcg caaaatgcgc ccgaatctac caaacagcct 480
 taa 483

<210> 1752
 <211> 160
 <212> PRT
 <213> Neisseria meningitidis

<400> 1752
 Met Glu Arg Asn Gly Val Phe Gly Lys Ile Val Gly Asn Arg Ile Leu
 1 5 10 15
 Arg Met Ser Ser Glu His Ala Ala Ala Ser Tyr Pro Lys Pro Cys Lys
 20 25 30
 Ser Phe Lys Leu Ala Gln Ser Trp Phe Arg Val Arg Ser Cys Leu Gly
 35 40 45
 Gly Val Phe Ile Tyr Gly Ala Asn Met Lys Leu Ile Tyr Thr Val Ile
 50 55 60
 Lys Ile Ile Ile Leu Leu Leu Phe Leu Leu Leu Ala Val Ile Asn Thr

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 65 | | 70 | | 75 | | 80 | | | | | | | | | |
| Asp | Ala | Val | Thr | Phe | Ser | Tyr | Leu | Pro | Gly | Gln | Lys | Phe | Asp | Leu | Pro |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Leu | Ile | Val | Val | Leu | Phe | Gly | Ala | Phe | Val | Val | Gly | Ile | Ile | Phe | Gly |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Met | Phe | Ala | Leu | Phe | Gly | Arg | Leu | Leu | Ser | Leu | Arg | Gly | Glu | Asn | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Arg | Leu | Arg | Ala | Glu | Val | Lys | Lys | Asn | Ala | Arg | Leu | Thr | Gly | Lys | Glu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Leu | Thr | Ala | Pro | Pro | Ala | Gln | Asn | Ala | Pro | Glu | Ser | Thr | Lys | Gln | Pro |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |

<210> 1753
 <211> 483
 <212> DNA
 <213> Neisseria meningitidis

<400> 1753
 atggaaagga acggtgtatt tggtaaaatt gtcggcaatc gcatactccg tatgtcgctcc 60
 gaacacgctg ccgcataccta tccgaaaccg tgcaaatacgt ttaaactagc gcaatcttgg 120
 ttcagagtgc gaagctgtcc gggcggcggtt ttattttacg gagcaaacaat gaaactttatc 180
 tataccgtca tcaaaatcat tatcctgctg ctcttcctgc tgcttgctgt cattaatacag 240
 gatgccgtta cctttttccta cctgccgggg caaaaattcg atttgccgct gattgtcgta 300
 ttgttcggcg cgtttgtcgt cggcatcgtg ttcggaatgt ttgccttgtt cggacgggtt 360
 ttgtcgttac gtggcgagaa cggcaggttg cgtgccgaag taaagaaaaa tgcgcggttg 420
 acggggaagg agctgaccgc accaccggcg caaaatgcgc ccgaatctgc caaacagcct 480
 tga 483

<210> 1754
 <211> 160
 <212> PRT
 <213> Neisseria meningitidis

<400> 1754
 Met Glu Arg Asn Gly Val Phe Gly Lys Ile Val Gly Asn Arg Ile Leu
 1 5 10 15
 Arg Met Ser Ser Glu His Ala Ala Ala Ser Tyr Pro Lys Pro Cys Lys
 20 25 30
 Ser Phe Lys Leu Ala Gln Ser Trp Phe Arg Val Arg Ser Cys Pro Gly
 35 40 45
 Gly Val Phe Ile Tyr Gly Ala Asn Met Lys Leu Ile Tyr Thr Val Ile
 50 55 60
 Lys Ile Ile Ile Leu Leu Leu Phe Leu Leu Leu Ala Val Ile Asn Thr

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 65 | | 70 | | 75 | | 80 | | | | | | | | | |
| Asp | Ala | Val | Thr | Phe | Ser | Tyr | Leu | Pro | Gly | Gln | Lys | Phe | Asp | Leu | Pro |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Leu | Ile | Val | Val | Leu | Phe | Gly | Ala | Phe | Val | Val | Gly | Ile | Val | Phe | Gly |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Met | Phe | Ala | Leu | Phe | Gly | Arg | Leu | Leu | Ser | Leu | Arg | Gly | Glu | Asn | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Arg | Leu | Arg | Ala | Glu | Val | Lys | Lys | Asn | Ala | Arg | Leu | Thr | Gly | Lys | Glu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Leu | Thr | Ala | Pro | Pro | Ala | Gln | Asn | Ala | Pro | Glu | Ser | Ala | Lys | Gln | Pro |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |

<210> 1755
 <211> 321
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1755
 atgggaaagc tcgacatcgg gatattgttt gccgatttct tcaaagattt cgcgccacag 60
 ttccgttggt tccaaaacgt tggctttgcc tacggagcag acttttttgc tgcgtttttg 120
 ggccgatttg aaggccacgt gggcgatgcg gcggatttcg ctttcgctgt atttcattgt 180
 gttgtagcct tcgtgttcgc cgtttttccaa aacacggatg ccgcgcgggt cgccgaaata 240
 aatatcgccg gtaagttcgc gcacaatcaa aatatccaaa ccggcaacga tttcaggctt 300
 gagcgtggag gcgttggtta a 321

<210> 1756
 <211> 106
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1756
 Met Gly Lys Leu Asp Ile Gly Ile Leu Phe Ala Asp Phe Phe Lys Asp
 1 5 10 15
 Phe Ala Pro Gln Phe Gly Gly Phe Gln Asn Val Gly Phe Ala Tyr Gly
 20 25 30
 Ala Asp Phe Phe Ala Ala Phe Leu Gly Gly Leu Glu Gly His Val Gly
 35 40 45
 Asp Ala Ala Asp Phe Ala Phe Ala Val Phe His Gly Val Val Ala Phe
 50 55 60
 Val Phe Ala Val Phe Gln Asn Thr Asp Ala Ala Arg Phe Ala Glu Ile
 65 70 75 80
 Asn Ile Ala Gly Lys Phe Ala His Asn Gln Asn Ile Gln Thr Gly Asn

85

90

95

Asp Phe Arg Leu Glu Arg Gly Gly Val Gly
100 105

<210> 1757

<211> 300

<212> DNA

<213> Neisseria meningitidis

<400> 1757

atgggaaagc tcgacatcag ggtactcttt gccgatttct tcaaagattt cgcgccacaa 60
ttcggtaggt tccaaaacgt tggctttgcc tacggaacag acttttttgc tgcgtttttg 120
ggcggattgg aaggcaacat gggcaatacg gcggtattcg ctttcgctgt atttcatggt 180
gtttagacct tcgcgttcgc cgttttccag aacgcggatg ccgcgcggtt cgccgaaata 240
gatgtcgccg gtgagttcgc gcacaatcaa aatatccaaa ccggaacga tttcaggctt 300

<210> 1758

<211> 106

<212> PRT

<213> Neisseria meningitidis

<400> 1758

Met Gly Lys Leu Asp Ile Arg Val Leu Phe Ala Asp Phe Phe Lys Asp
1 5 10 15

Phe Ala Pro Gln Phe Gly Gly Phe Gln Asn Val Gly Phe Ala Tyr Gly
20 25 30

Thr Asp Phe Phe Ala Ala Phe Leu Gly Gly Leu Glu Gly Asn Met Gly
35 40 45

Asn Thr Ala Asp Phe Ala Phe Ala Val Phe His Gly Val Val Ala Phe
50 55 60

Ala Phe Ala Val Phe Gln Asn Ala Asp Ala Ala Arg Phe Ala Glu Ile
65 70 75 80

Asp Val Ala Gly Glu Phe Ala His Asn Gln Asn Ile Gln Thr Gly Asn
85 90 95

Asp Phe Arg Leu Gln Arg Gly Gly Val Gly
100 105

<210> 1759

<211> 321

<212> DNA

<213> Neisseria meningitidis

<400> 1759

atgggaaagc tcgacatcag ggtattcttt gccgatttct tcaaagattt cgcgccacaa 60
ttcggtaggt tccaaaacgt tggctttgcc tacggagcag acttttttgc tgcgtttttg 120
ggcggattgg aaggcgacgt gggcaatacg gcggtattcg ctttcgctgt atttcatggt 180
gtttagacct tcgcgttcgc cgttttccag aacacggatg ccgcgcggtt cgccgaaata 240

aatatcgccg gtgagttcgc gcacaatcaa aatatccaaa cccgcaacga tttcagactt 300
gagcgtggag gcgttggtta g 321

<210> 1760
<211> 106
<212> PRT
<213> Neisseria meningitidis

<400> 1760
Met Gly Lys Leu Asp Ile Arg Val Phe Phe Ala Asp Phe Phe Lys Asp
1 5 10 15
Phe Ala Pro Gln Phe Gly Gly Phe Gln Asn Val Gly Phe Ala Tyr Gly
20 25 30
Ala Asp Phe Phe Ala Ala Phe Leu Gly Gly Leu Glu Gly Asp Val Gly
35 40 45
Asn Thr Ala Asp Phe Ala Phe Ala Val Phe His Gly Val Val Ala Phe
50 55 60
Ala Phe Ala Val Phe Gln Asn Thr Asp Ala Ala Arg Phe Ala Glu Ile
65 70 75 80
Asn Ile Ala Gly Glu Phe Ala His Asn Gln Asn Ile Gln Thr Arg Asn
85 90 95
Asp Phe Arg Leu Glu Arg Gly Gly Val Gly
100 105

<210> 1761
<211> 696
<212> DNA
<213> Neisseria gonorrhoeae

<400> 1761
atgagggcgg cgatgacgcg cgcgcaggtc gatgccacgc tgattagttt tttgtgtaat 60
gttgccaata tcggttatt gattttggtg attattgccg cattgggacg gttgggcgtt 120
tccacaacat ccgtaaccgc cttaatcggc ggcgcggggtt tggcgggtggc gttgtcctta 180
aaagaccagc tgtccaattt tgccgccggc gcgctgatta tcctgttcgc cccgttcaaa 240
gtcggcgact ttatccgtgt cggcgggttt gaaggatatg tccgggaaat caaaatgggtg 300
cagacttctt tgcggacgac cgacaacgaa gaagtcgtgc tgcccaacag cgtggtgatg 360
ggcaacagca tcgtcaaccg ttccagcctg ccgctttgcc gcgccaagt gatagtcggc 420
gtcgattaca actgcgattt gaaagtggcg aaagaggcgg tgttgaaagc cgccgccgaa 480
cacccttga gcgttcaaaa cgaagagcgg cagcccgccg cctacatcac cgccttgggc 540
gacaatgcc a tcgaaatcac attatgggct tgggcaaacg aagcagaccg ctggacgctg 600
caatgcgact tgaacgaaca agtggtcgaa aacctccgca aagtcaatat caacatcccg 660
ttcccgcaac gcgacataca catcatcaat tcttaa 696

<210> 1762
<211> 231
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1762

```
Met Arg Ala Ala Met Thr Arg Ala Gln Val Asp Ala Thr Leu Ile Ser
 1             5             10             15

Phe Leu Cys Asn Val Ala Asn Ile Gly Leu Leu Ile Leu Val Ile Ile
      20             25             30

Ala Ala Leu Gly Arg Leu Gly Val Ser Thr Thr Ser Val Thr Ala Leu
      35             40             45

Ile Gly Gly Ala Gly Leu Ala Val Ala Leu Ser Leu Lys Asp Gln Leu
      50             55             60

Ser Asn Phe Ala Ala Gly Ala Leu Ile Ile Leu Phe Arg Pro Phe Lys
 65             70             75             80

Val Gly Asp Phe Ile Arg Val Gly Gly Phe Glu Gly Tyr Val Arg Glu
      85             90             95

Ile Lys Met Val Gln Thr Ser Leu Arg Thr Thr Asp Asn Glu Glu Val
      100            105            110

Val Leu Pro Asn Ser Val Val Met Gly Asn Ser Ile Val Asn Arg Ser
      115            120            125

Ser Leu Pro Leu Cys Arg Ala Gln Val Ile Val Gly Val Asp Tyr Asn
      130            135            140

Cys Asp Leu Lys Val Ala Lys Glu Ala Val Leu Lys Ala Ala Ala Glu
      145            150            155            160

His Pro Leu Ser Val Gln Asn Glu Glu Arg Gln Pro Ala Ala Tyr Ile
      165            170            175

Thr Ala Leu Gly Asp Asn Ala Ile Glu Ile Thr Leu Trp Ala Trp Ala
      180            185            190

Asn Glu Ala Asp Arg Trp Thr Leu Gln Cys Asp Leu Asn Glu Gln Val
      195            200            205

Val Glu Asn Leu Arg Lys Val Asn Ile Asn Ile Pro Phe Pro Gln Arg
      210            215            220

Asp Ile His Ile Ile Asn Ser
      225            230
```

<210> 1763

<211> 696

<212> DNA

<213> Neisseria meningitidis

<400> 1763

```
atgagggcg c gatgacgcg cgcgcaggtc gatgccacgc tgattagttt tttgtgtaat 60
gttgccaata tcggcttatt gattttggtg attattgccg cattgggcag attgggcgtt 120
tccacaacat ccgtaaccgc cttaatcggc ggcgcgggtt tggcgggtgc gttgtccctg 180
```

```

aaagaccagc tgtccaattt tgccgccggc gcaactgatta tcctgttccg cccgttcaaa 240
gtcggcgatt ttatccgcgt cggcggtttt gaaggatatg tccgagagat taaaatggtg 300
cagacttctt tgcggaacgac cgacaacgaa gaagtcgtgc tgcccaacag cgtggtgatg 360
ggcaacagca tcgtcaaccg ttccacactg ccgctgtgcc gcgccaagt gatagtcggc 420
gtcgattaca actgcgattt gaaagtggcg aaagaggcgg tgttgaaagc cgccgtcgaa 480
cacccttga gcgttcaaaa cgaagagcgg caggctgccg cctacatcac cgccttgggc 540
gacaatgcca tcgaaatcac attatgggct tgggcaaacg aagcagaccg ctggacgctg 600
caatgcgact tgaacgaaca agtggtcgaa aacctccgca aagtcaatat caacatcccg 660
ttcccgaac gcgacatata catcatcaat tcttaa 696

```

<210> 1764

<211> 231

<212> PRT

<213> *Neisseria meningitidis*

<400> 1764

```

Met Arg Ala Ala Met Thr Arg Ala Gln Val Asp Ala Thr Leu Ile Ser
  1             5             10             15

```

```

Phe Leu Cys Asn Val Ala Asn Ile Gly Leu Leu Ile Leu Val Ile Ile
          20             25             30

```

```

Ala Ala Leu Gly Arg Leu Gly Val Ser Thr Thr Ser Val Thr Ala Leu
          35             40             45

```

```

Ile Gly Gly Ala Gly Leu Ala Val Ala Leu Ser Leu Lys Asp Gln Leu
          50             55             60

```

```

Ser Asn Phe Ala Ala Gly Ala Leu Ile Ile Leu Phe Arg Pro Phe Lys
          65             70             75             80

```

```

Val Gly Asp Phe Ile Arg Val Gly Gly Phe Glu Gly Tyr Val Arg Glu
          85             90             95

```

```

Ile Lys Met Val Gln Thr Ser Leu Arg Thr Thr Asp Asn Glu Glu Val
          100            105            110

```

```

Val Leu Pro Asn Ser Val Val Met Gly Asn Ser Ile Val Asn Arg Ser
          115            120            125

```

```

Thr Leu Pro Leu Cys Arg Ala Gln Val Ile Val Gly Val Asp Tyr Asn
          130            135            140

```

```

Cys Asp Leu Lys Val Ala Lys Glu Ala Val Leu Lys Ala Ala Val Glu
          145            150            155            160

```

```

His Pro Leu Ser Val Gln Asn Glu Glu Arg Gln Ala Ala Ala Tyr Ile
          165            170            175

```

```

Thr Ala Leu Gly Asp Asn Ala Ile Glu Ile Thr Leu Trp Ala Trp Ala
          180            185            190

```

```

Asn Glu Ala Asp Arg Trp Thr Leu Gln Cys Asp Leu Asn Glu Gln Val
          195            200            205

```

```

Val Glu Asn Leu Arg Lys Val Asn Ile Asn Ile Pro Phe Pro Gln Arg

```

210

215

220

Asp Ile His Ile Ile Asn Ser
225 230

<210> 1765

<211> 696

<212> DNA

<213> Neisseria meningitidis

<400> 1765

```

atgagggcgg cgatgacgcg cgcgcaggtc gatgccacgc tgattagttt tttgtgtaat 60
gttgccaata tcggcttatt gattttggtg attattgccg cattgggcag attgggcgtt 120
tccacaacat ccgtaaccgc cttaatcggc gccgcgggtt tggcgggtggc gttgtccttg 180
aaagaccagc tgtccaattt tgccgccggc gcgctgatta tcctgttccg cccgttcaaa 240
gtcggcgatt ttatccgcgt cggcggtttt gaaggatatg tccgagagat taaaatggtg 300
cagacttctt tgccgacgac cgacaacgaa gaagtcgtgc tgcccaacag cgtggtgatg 360
ggcaacagca tcgtcaaccg ttccacactg ccgctgtgcc gcgcccaagt gatagtcggc 420
gtcgattaca actgcgattt gaaagtggcg aaagaggcgg tgttgaaagc cgccgtcgaa 480
cacccttga gcgttcaaaa cgaagagcgg caggccgcg cctacatcac cgccttgggc 540
gacaatgcca tcgaaatcac attatgggct tgggcaaacg aagcagaccg ctggacgctg 600
caatgcgact tgaacgaaca agtggtcgaa aacctccgca aagtcaatat caacatcccg 660
ttcccgaac gcgacataca catcatcaat tcttaa 696

```

<210> 1766

<211> 231

<212> PRT

<213> Neisseria meningitidis

<400> 1766

Met Arg Ala Ala Met Thr Arg Ala Gln Val Asp Ala Thr Leu Ile Ser
1 5 10 15

Phe Leu Cys Asn Val Ala Asn Ile Gly Leu Leu Ile Leu Val Ile Ile
20 25 30

Ala Ala Leu Gly Arg Leu Gly Val Ser Thr Thr Ser Val Thr Ala Leu
35 40 45

Ile Gly Gly Ala Gly Leu Ala Val Ala Leu Ser Leu Lys Asp Gln Leu
50 55 60

Ser Asn Phe Ala Ala Gly Ala Leu Ile Ile Leu Phe Arg Pro Phe Lys
65 70 75 80

Val Gly Asp Phe Ile Arg Val Gly Gly Phe Glu Gly Tyr Val Arg Glu
85 90 95

Ile Lys Met Val Gln Thr Ser Leu Arg Thr Thr Asp Asn Glu Glu Val
100 105 110

Val Leu Pro Asn Ser Val Val Met Gly Asn Ser Ile Val Asn Arg Ser
115 120 125

Thr Leu Pro Leu Cys Arg Ala Gln Val Ile Val Gly Val Asp Tyr Asn

130 135 140
 Cys Asp Leu Lys Val Ala Lys Glu Ala Val Leu Lys Ala Ala Val Glu
 145 150 155 160
 His Pro Leu Ser Val Gln Asn Glu Glu Arg Gln Ala Ala Ala Tyr Ile
 165 170 175
 Thr Ala Leu Gly Asp Asn Ala Ile Glu Ile Thr Leu Trp Ala Trp Ala
 180 185 190
 Asn Glu Ala Asp Arg Trp Thr Leu Gln Cys Asp Leu Asn Glu Gln Val
 195 200 205
 Val Glu Asn Leu Arg Lys Val Asn Ile Asn Ile Pro Phe Pro Gln Arg
 210 215 220
 Asp Ile His Ile Ile Asn Ser
 225 230

<210> 1767
 <211> 849
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1767
 atggacttca aacaatttga ttttttacac ctgatcagtg tttccggttg ggggcactctg 60
 gctgaaaagg cgtgggcgtt cgggctgaac cttgccgcg cgctgcttat tttcttggtc 120
 gggaaatggg cggcgaaacg cattgtcgcc gtaatgagg cggcgatgac gcgcgcgcag 180
 gtcgatgcca cgctgattag ttttttgtgt aatgttgcca atatcggctt attgattttg 240
 gtgattattg ccgcattggg acggttgggc gttccacaa catccgtaac cgccttaatc 300
 ggcggcgcgg gtttgccggt ggcgttgctc ttaaaagacc agctgtccaa ttttgccgcc 360
 ggcgcgctga ttatcctggt ccgccggtt aaagtcggcg actttatccg tgtcggcgg 420
 tttgaaggat atgtccggga aatcaaaatg gtgcagactt ctttgccgac gaccgacaac 480
 gaagaagtgc tgctgcccac cagcgtggtg atgggcaaca gcatcgtcaa ccgttccagc 540
 ctgccgcttt gccgcgcca agtgatagtc ggcgtcgatt acaactgcga tttgaaagt 600
 gcgaaagagg cggtgttgaa agccgccgcc gaacaccct tgagcgttca aaacgaagag 660
 cggcagcccg ccgcctacat caccgccttg ggcgacaatg ccacgaaat cacattatgg 720
 gcttgggcaa acgaagcaga ccgctggacg ctgcaatgcg acttgaacga acaagtggtc 780
 gaaaacctcc gcaaagtcaa tatcaacatc ccgttccgcg aacgcgacat acacatcatc 840
 aattcttaa 849

<210> 1768
 <211> 282
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1768
 Met Asp Phe Lys Gln Phe Asp Phe Leu His Leu Ile Ser Val Ser Gly
 1 5 10 15
 Trp Gly His Leu Ala Glu Lys Ala Trp Ala Phe Gly Leu Asn Leu Ala
 20 25 30

Ala Ala Leu Leu Ile Phe Leu Val Gly Lys Trp Ala Ala Lys Arg Ile
 35 40 45
 Val Ala Val Met Arg Ala Ala Met Thr Arg Ala Gln Val Asp Ala Thr
 50 55 60
 Leu Ile Ser Phe Leu Cys Asn Val Ala Asn Ile Gly Leu Leu Ile Leu
 65 70 75 80
 Val Ile Ile Ala Ala Leu Gly Arg Leu Gly Val Ser Thr Thr Ser Val
 85 90 95
 Thr Ala Leu Ile Gly Gly Ala Gly Leu Ala Val Ala Leu Ser Leu Lys
 100 105 110
 Asp Gln Leu Ser Asn Phe Ala Ala Gly Ala Leu Ile Ile Leu Phe Arg
 115 120 125
 Pro Phe Lys Val Gly Asp Phe Ile Arg Val Gly Gly Phe Glu Gly Tyr
 130 135 140
 Val Arg Glu Ile Lys Met Val Gln Thr Ser Leu Arg Thr Thr Asp Asn
 145 150 155 160
 Glu Glu Val Val Leu Pro Asn Ser Val Val Met Gly Asn Ser Ile Val
 165 170 175
 Asn Arg Ser Ser Leu Pro Leu Cys Arg Ala Gln Val Ile Val Gly Val
 180 185 190
 Asp Tyr Asn Cys Asp Leu Lys Val Ala Lys Glu Ala Val Leu Lys Ala
 195 200 205
 Ala Ala Glu His Pro Leu Ser Val Gln Asn Glu Glu Arg Gln Pro Ala
 210 215 220
 Ala Tyr Ile Thr Ala Leu Gly Asp Asn Ala Ile Glu Ile Thr Leu Trp
 225 230 235 240
 Ala Trp Ala Asn Glu Ala Asp Arg Trp Thr Leu Gln Cys Asp Leu Asn
 245 250 255
 Glu Gln Val Val Glu Asn Leu Arg Lys Val Asn Ile Asn Ile Pro Phe
 260 265 270
 Pro Gln Arg Asp Ile His Ile Ile Asn Ser
 275 280

<210> 1769

<211> 849

<212> DNA

<213> Neisseria meningitidis

<400> 1769

atggacttca aacaatttga ttttttacac ctgatcagtg tttccggttg ggagcatctg 60
 gctgaaaagg cgtgggcgtt cgggctgaac cttgccgccg cgctgcttat ttttttggtc 120

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ggaaaaatggg cggcgaaaacg cattgtcgct gtgatgaggg cggcgatgac gcgcgcgag 180
gtcgatgcca cgctgattag tttttgtgt aatgttgcca atatcggctt attgattttg 240
gtgattattg ccgcattggg cagattgggc gtttccacaa catccgtaac cgccttaatc 300
ggcggcgcg gtttggcggg ggcgttgctc ctgaaagacc agctgtccaa ttttgccgcc 360
ggcgactga ttatcctgtt ccgcccgttc aaagtcggcg attttatccg cgtcggcggt 420
tttgaaggat atgtccgaga gattaaaatg gtgcagactt ctttgcgac gaccgacaac 480
gaagaagtcg tgctgccccaa cagcgtggtg atgggcaaca gcatcgtcaa ccgttccaca 540
ctgccgctgt gccgcgcccc aagtatagtc ggcgtcgatt acaactgcga tttgaaagtg 600
gcgaaagagg cgggtgttgaa agccgccgtc gaacacccct tgagcgttca aaacgaagag 660
cggcaggctg ccgcctacat caccgccttg ggcgacaatg ccatcgaaat cacattatgg 720
gcttgggcaa acgaagcaga ccgctggacg ctgcaatgcg acttgaacga acaagtggtc 780
gaaaacctcc gcaaagtcaa tatcaacatc ccgttccgc aacgcgacat acacatcatc 840
aattcttaa
849

```

<210> 1770

<211> 282

<212> PRT

<213> *Neisseria meningitidis*

<400> 1770

```

Met Asp Phe Lys Gln Phe Asp Phe Leu His Leu Ile Ser Val Ser Gly
 1             5             10             15

Trp Glu His Leu Ala Glu Lys Ala Trp Ala Phe Gly Leu Asn Leu Ala
      20             25             30

Ala Ala Leu Leu Ile Phe Leu Val Gly Lys Trp Ala Ala Lys Arg Ile
      35             40             45

Val Ala Val Met Arg Ala Ala Met Thr Arg Ala Gln Val Asp Ala Thr
      50             55             60

Leu Ile Ser Phe Leu Cys Asn Val Ala Asn Ile Gly Leu Leu Ile Leu
      65             70             75             80

Val Ile Ile Ala Ala Leu Gly Arg Leu Gly Val Ser Thr Thr Ser Val
      85             90             95

Thr Ala Leu Ile Gly Gly Ala Gly Leu Ala Val Ala Leu Ser Leu Lys
      100            105            110

Asp Gln Leu Ser Asn Phe Ala Ala Gly Ala Leu Ile Ile Leu Phe Arg
      115            120            125

Pro Phe Lys Val Gly Asp Phe Ile Arg Val Gly Gly Phe Glu Gly Tyr
      130            135            140

Val Arg Glu Ile Lys Met Val Gln Thr Ser Leu Arg Thr Thr Asp Asn
      145            150            155            160

Glu Glu Val Val Leu Pro Asn Ser Val Val Met Gly Asn Ser Ile Val
      165            170            175

Asn Arg Ser Thr Leu Pro Leu Cys Arg Ala Gln Val Ile Val Gly Val
      180            185            190

```

Asp Tyr Asn Cys Asp Leu Lys Val Ala Lys Glu Ala Val Leu Lys Ala
195 200 205

Ala Val Glu His Pro Leu Ser Val Gln Asn Glu Glu Arg Gln Ala Ala
210 215 220

Ala Tyr Ile Thr Ala Leu Gly Asp Asn Ala Ile Glu Ile Thr Leu Trp
225 230 235 240

Ala Trp Ala Asn Glu Ala Asp Arg Trp Thr Leu Gln Cys Asp Leu Asn
245 250 255

Glu Gln Val Val Glu Asn Leu Arg Lys Val Asn Ile Asn Ile Pro Phe
260 265 270

Pro Gln Arg Asp Ile His Ile Ile Asn Ser
275 280

<210> 1771

<211> 849

<212> DNA

<213> Neisseria meningitidis

<400> 1771

atggacttca aacaatttga ttttttacac ctgataagtg cttccggctg ggagcatctg 60
gctgaaaagg cgtgggcggt cgggctgaac cttgccgcg cgctgcttat ttttttggtc 120
ggaaaatggg cggcgaaacg cattgtcgcc gtgatgaggg cggcgatgac gcgcgcgcag 180
gtcgatgccg cgctgattag ttttttgtgt aatgttgcca atatcggctt attgattttg 240
gtgattattg ccgcattggg cagattgggc gtttccacaa catccgtaac cgccttaatc 300
ggcggcgcg gtttggcggt ggcgttgctc ttgaaagacc agctgtccaa ttttgccgcc 360
ggcgcgctga ttatcctggt ccgcccggtc aaagtgcggc attttatccg cgtcggcggt 420
tttgaaggat atgtccgaga gattaaaatg gtgcagactt ctttgcggac gaccgacaac 480
gaagaagtcg tgctgcccga cagcgtggtg atgggcaaca gcatcgtcaa ccgttccaca 540
ctgccgctgt gccgcgccca agtgatagtc ggcgtcgatt acaactgcga tttgaaagtg 600
gcgaaagagg cgggtgttgaa agccgcgcgc gaacacccct tgagcgttca aaacgaagag 660
cggcaggccg ccgcctacat caccgccttg ggcgacaatg ccatcgaaat cacattatgg 720
gcttgggcaa acgaagcaga ccgctggacg ctgcaatgcg acttgaacga acaagtggtc 780
gaaaacctcc gcaaagtcaa tatcaacatc ccgttccgc aacgcgacat acacatcatc 840
aattcttaa 849

<210> 1772

<211> 282

<212> PRT

<213> Neisseria meningitidis

<400> 1772

Met Asp Phe Lys Gln Phe Asp Phe Leu His Leu Ile Ser Ala Ser Gly
1 5 10 15

Trp Glu His Leu Ala Glu Lys Ala Trp Ala Phe Gly Leu Asn Leu Ala
20 25 30

Ala Ala Leu Leu Ile Phe Leu Val Gly Lys Trp Ala Ala Lys Arg Ile
35 40 45

Val Ala Val Met Arg Ala Ala Met Thr Arg Ala Gln Val Asp Ala Thr
 50 55 60
 Leu Ile Ser Phe Leu Cys Asn Val Ala Asn Ile Gly Leu Leu Ile Leu
 65 70 75 80
 Val Ile Ile Ala Ala Leu Gly Arg Leu Gly Val Ser Thr Thr Ser Val
 85 90 95
 Thr Ala Leu Ile Gly Gly Ala Gly Leu Ala Val Ala Leu Ser Leu Lys
 100 105 110
 Asp Gln Leu Ser Asn Phe Ala Ala Gly Ala Leu Ile Ile Leu Phe Arg
 115 120 125
 Pro Phe Lys Val Gly Asp Phe Ile Arg Val Gly Gly Phe Glu Gly Tyr
 130 135 140
 Val Arg Glu Ile Lys Met Val Gln Thr Ser Leu Arg Thr Thr Asp Asn
 145 150 155 160
 Glu Glu Val Val Leu Pro Asn Ser Val Val Met Gly Asn Ser Ile Val
 165 170 175
 Asn Arg Ser Thr Leu Pro Leu Cys Arg Ala Gln Val Ile Val Gly Val
 180 185 190
 Asp Tyr Asn Cys Asp Leu Lys Val Ala Lys Glu Ala Val Leu Lys Ala
 195 200 205
 Ala Val Glu His Pro Leu Ser Val Gln Asn Glu Glu Arg Gln Ala Ala
 210 215 220
 Ala Tyr Ile Thr Ala Leu Gly Asp Asn Ala Ile Glu Ile Thr Leu Trp
 225 230 235 240
 Ala Trp Ala Asn Glu Ala Asp Arg Trp Thr Leu Gln Cys Asp Leu Asn
 245 250 255
 Glu Gln Val Val Glu Asn Leu Arg Lys Val Asn Ile Asn Ile Pro Phe
 260 265 270
 Pro Gln Arg Asp Ile His Ile Ile Asn Ser
 275 280

<210> 1773

<211> 303

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1773

atggattcgc ccaaggtcgg gtgcgggtgg atggttttgc cgatgtctgc cgcgtcgcag 60
 cccatttcga tggcaaggca gacttcgccg atcatgtcgc caccgttcgg accgacaatg 120
 ccgccgccga tgatgcggcc ggtttcggca tcgaaaatca gcttggtaaa gccgttgctg 180
 caaccgttg caatcgcacg accggaagcc gcccatggga agttggcttt ggtaattttg 240
 cggcctgatg ctttggcaga caattcgggt tcaccgaccc atgccacttc gggggaagtg 300

tag

303

<210> 1774

<211> 100

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1774

Met Asp Ser Pro Lys Val Gly Cys Gly Trp Met Val Leu Pro Met Ser
1 5 10 15

Ala Ala Ser Gln Pro Ile Ser Met Ala Arg Gln Thr Ser Pro Ile Met
20 25 30

Ser Pro Pro Phe Gly Pro Thr Met Pro Pro Pro Met Met Arg Pro Val
35 40 45

Ser Ala Ser Lys Ile Ser Leu Val Lys Pro Leu Ser Gln Pro Leu Ala
50 55 60

Ile Ala Arg Pro Glu Ala Ala His Gly Lys Leu Ala Leu Val Ile Leu
65 70 75 80

Arg Pro Asp Ala Leu Ala Asp Asn Ser Val Ser Pro Thr His Ala Thr
85 90 95

Ser Gly Glu Val
100

<210> 1775

<211> 303

<212> DNA

<213> *Neisseria meningitidis*

<400> 1775

atggattcgc ccaaggtcgg gtgcgggtgg atggttttgc cgatgtctgc cgcgtcgcag 60
cccatttoga tggcaaggca gacttcgccg atcatatcgc caccgttcgg accgacaatg 120
ccgccgccga tgatgcggcc ggtttcggca tcaaaaatca gcttggtaaa gccgttgctg 180
caaccgttgg caatcgcacg gccggaagcc gccacggga agttggcttt ggtgattttg 240
cggccggagg ctttggcgga cagttcggtt tcgcccaccc acgccacttc gggggaagtg 300
tag 303

<210> 1776

<211> 100

<212> PRT

<213> *Neisseria meningitidis*

<400> 1776

Met Asp Ser Pro Lys Val Gly Cys Gly Trp Met Val Leu Pro Met Ser
1 5 10 15

Ala Ala Ser Gln Pro Ile Ser Met Ala Arg Gln Thr Ser Pro Ile Ile
20 25 30

Ser Pro Pro Phe Gly Pro Thr Met Pro Pro Pro Met Met Arg Pro Val
 35 40 45
 Ser Ala Ser Lys Ile Ser Leu Val Lys Pro Leu Ser Gln Pro Leu Ala
 50 55 60
 Ile Ala Arg Pro Glu Ala Ala His Gly Lys Leu Ala Leu Val Ile Leu
 65 70 75 80
 Arg Pro Glu Ala Leu Ala Asp Ser Ser Val Ser Pro Thr His Ala Thr
 85 90 95
 Ser Gly Glu Val
 100

<210> 1777
 <211> 303
 <212> DNA
 <213> Neisseria meningitidis

<400> 1777
 atggattcgc ccaaggtcgg gtgcgggtgg atggttttgc cgatgtctgc cgcgtcgcag 60
 cccatttcga tggcaaggca gacttcgccg atcatgtcgc caccgttcgg accgacaatg 120
 ccgccgccga tgatgcggcc ggtttcagca tcaaaaatca gcttggtgaa accattgtcg 180
 caaccgttgg caatcgcacg gccggaagca gcccatggga agttggcttt ggtgattttg 240
 cggccggagg ctttggcaga caattcggtt tcgcccaccc atgccacttc aggagaagtg 300
 taa 303

<210> 1778
 <211> 100
 <212> PRT
 <213> Neisseria meningitidis

<400> 1778
 Met Asp Ser Pro Lys Val Gly Cys Gly Trp Met Val Leu Pro Met Ser
 1 5 10 15
 Ala Ala Ser Gln Pro Ile Ser Met Ala Arg Gln Thr Ser Pro Ile Met
 20 25 30
 Ser Pro Pro Phe Gly Pro Thr Met Pro Pro Pro Met Met Arg Pro Val
 35 40 45
 Ser Ala Ser Lys Ile Ser Leu Val Lys Pro Leu Ser Gln Pro Leu Ala
 50 55 60
 Ile Ala Arg Pro Glu Ala Ala His Gly Lys Leu Ala Leu Val Ile Leu
 65 70 75 80
 Arg Pro Glu Ala Leu Ala Asp Asn Ser Val Ser Pro Thr His Ala Thr
 85 90 95
 Ser Gly Glu Val
 100

<210> 1779
 <211> 342
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1779
 atgcacttcg cccagcttgt ggggtcaaacc ggtatagaac aaaatacgtt ctgtcgtcgt 60
 gggttttacc gcacgcgat gggcggaat accgatgttg cggtagaggc tgatcggggg 120
 cttacgagcc attttattag cctttcaaaa ttagaaacgg aagttagaga atgctttgtt 180
 ggcttcagcc atacggtgta cttcttcacg ttttttcaac gcaccgccac ggccttcgga 240
 cgcacaaatc aactcgctg ccaaacgcag atccatggat ttctcaccac gtttgcgggc 300
 cgcgtcgcga acccaacgca ttgccaaagc cagacggcgt ga 342

<210> 1780
 <211> 113
 <212> PRT
 <213> *Neisseria gonorrhoeae*

<400> 1780
 Met His Phe Ala Gln Leu Val Gly Gln Thr Gly Ile Glu Gln Asn Thr
 1 5 10 15
 Phe Cys Arg Arg Gly Phe Thr Arg Ile Asp Met Gly Gly Asn Thr Asp
 20 25 30
 Val Ala Val Gln Ala Asp Arg Gly Leu Thr Ser His Phe Ile Ser Leu
 35 40 45
 Ser Lys Leu Glu Thr Glu Val Arg Glu Cys Phe Val Gly Phe Ser His
 50 55 60
 Thr Val Tyr Phe Phe Thr Phe Phe Gln Arg Thr Ala Thr Ala Phe Gly
 65 70 75 80
 Arg Ile Asn Gln Leu Ala Cys Gln Thr Gln Ile His Gly Phe Leu Thr
 85 90 95
 Thr Phe Ala Gly Arg Val Ala Asn Pro Thr His Cys Gln Ser Gln Thr
 100 105 110
 Ala

<210> 1781
 <211> 342
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1781
 atgcacttcg cccagcttgt ggggtcaaacc ggtatagaac aaaatacgtt ctgtcgtcgt 60
 gggttttacc gcgtcaatat gggcggaat accgatgtta cggtagaggc tgatcggggg 120
 cttacgagcc attttattag cctttcaaaa ttagaaacgg aagttagaga atgctttgtt 180
 ggcttcagcc atacggtgta cttcttcacg ttttttcaac gcaccgccac ggccttcgga 240
 cgcacaaatc aattcgctg ccaaacgcag gtccatggat ttctcaccac gtttgcgggc 300

cgcatcgcgga acccagcgca ttgccaaagc caaacggcgt ga

342

<210> 1782

<211> 113

<212> PRT

<213> *Neisseria meningitidis*

<400> 1782

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | His | Phe | Ala | Gln | Leu | Val | Gly | Gln | Thr | Gly | Ile | Glu | Gln | Asn | Thr |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | Cys | Arg | Arg | Gly | Phe | Thr | Arg | Val | Asn | Met | Gly | Gly | Asn | Thr | Asp |
| | | | 20 | | | | | 25 | | | | | 30 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Thr | Val | Gln | Ala | Asp | Arg | Gly | Leu | Thr | Ser | His | Phe | Ile | Ser | Leu |
| | | 35 | | | | | 40 | | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Lys | Leu | Glu | Thr | Glu | Val | Arg | Glu | Cys | Phe | Val | Gly | Phe | Ser | His |
| | 50 | | | | | 55 | | | | | 60 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Val | Tyr | Phe | Phe | Thr | Phe | Phe | Gln | Arg | Thr | Ala | Thr | Ala | Phe | Gly |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Ile | Asn | Gln | Phe | Ala | Cys | Gln | Thr | Gln | Val | His | Gly | Phe | Leu | Thr |
| | | | 85 | | | | | | 90 | | | | | 95 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Phe | Ala | Gly | Arg | Ile | Ala | Asn | Pro | Ala | His | Cys | Gln | Ser | Gln | Thr |
| | | | 100 | | | | | 105 | | | | | | 110 | |

Ala

<210> 1783

<211> 342

<212> DNA

<213> *Neisseria meningitidis*

<400> 1783

| | | | | | | |
|-------------|------------|------------|------------|------------|------------|-----|
| atgcacttcg | cccagcttgt | gggtcaaacc | ggtatagaac | aaaatacgtt | ctgtcgtcgt | 60 |
| ggttttaccc | gcacgatata | gggcggaaat | accgatgtta | cggtacaggc | tgatcggggg | 120 |
| cttacgagcc | attttattag | cctttcaaaa | ttagaaacgg | aagtgagaga | atgctttgtt | 180 |
| ggcttcagcc | atacgggtga | cttcttcacg | ttttttcaac | gcaccgccac | ggccttcgga | 240 |
| cgcatcaatc | aattgcctg | ccaaacgcag | gtccatggat | ttctcaccac | gtttgcgggc | 300 |
| cgcatcgcgga | acccagcgca | ttgccaaagc | caaacggcgt | ga | | 342 |

<210> 1784

<211> 112

<212> PRT

<213> *Neisseria meningitidis*

<400> 1784

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | His | Phe | Ala | Gln | Leu | Val | Gly | Gln | Thr | Gly | Ile | Glu | Gln | Asn | Thr |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |

Phe Cys Arg Arg Gly Phe Thr Arg Ile Asp Met Gly Gly Asn Thr Asp
20 25 30
Val Thr Val Gln Ala Asp Arg Gly Leu Thr Ser His Phe Ile Ser Leu
35 40 45
Ser Lys Leu Glu Thr Glu Val Arg Glu Cys Phe Val Gly Phe Ser His
50 55 60
Thr Val Tyr Phe Phe Thr Phe Phe Gln Arg Thr Ala Thr Ala Phe Gly
65 70 75 80
Arg Ile Asn Gln Phe Ala Cys Gln Thr Gln Val His Gly Phe Leu Thr
85 90 95
Thr Phe Ala Gly Arg Ile Asn Pro Ala His Cys Gln Ser Gln Thr Ala
100 105 110

<210> 1785
<211> 1113
<212> DNA
<213> *Neisseria gonorrhoeae*

<400> 1785
atgcgctata ttcttttgac aggactgttg ccgacggcat ccgcttttgg agagaccgcg 60
ctgcaatgcg ccgcttttgac ggacaatgtt acgcgtttgg cgtgttacga caggattttt 120
gcggcacagc ttccgtcttc gccagggcag gaagggcgagg agtcgaaagc cgtactcaat 180
ctgacggaaa ccgtccgcag cagcttggat aagggcgagg cggtcattgt tgttgaaaaa 240
ggcgggggatg cgcttcctgc cgacagtgcg ggcgaaaccg ccgatatacta tacgcctttg 300
agcctgatgt acgacttggc caaaaacgat ttgcgcgggc tgttgggcgt acgcgaacac 360
aatccgatgt accttatgcc gttttggtat aacaattcgc ccaactatgc cccgagttcg 420
ccgacgcgcg gtacgactgt acaggaaaaa ttccggacagc agaaacgtgc ggaaaccaa 480
ttgcagggtt cgttcaaaag caaaattgcc gaaaatttgt ttaaaaccgc gcgggatctg 540
tggttcggct acacccaaag atccgattgg cagatttaca accaaggcag gaaatccgcg 600
ccgttccgca atacggatta caaacctgaa attttcctga ccagcctgt gaaggcggat 660
ttgccgttcg gcggcaggct gcgtatgctc ggtgcgggtt ttgtccacca gtccaacgga 720
cagagccgtc ccgaatcgcg ttcgtggaac aggatttatg ccattggcagg catggaatgg 780
ggcaaattga cgggtgattcc gcgcgtgtgg gtgcgtgcgt tcgatcagag cggcgataaa 840
aacgacaatc ccgatattgc cgactatatg gggatatggc acgtgaagct gcagtaccgc 900
ctgaacgaca ggcagaatgt gtattccgta ttgcgctaca accccaaaac gggctacggc 960
gcgattgaag ccgcctacac gtttccgatt aagggcaaac tcaaaggcgt ggtacgcgga 1020
ttccacgggt acggcgagag cctgatcgac tacaaccaca agcagaacgg tatcggtatc 1080
gggttgatgt tcaacgactg ggacggcatc tga 1113

<210> 1786
<211> 370
<212> PRT
<213> *Neisseria gonorrhoeae*

<400> 1786
Met Arg Tyr Ile Leu Leu Thr Gly Leu Leu Pro Thr Ala Ser Ala Phe

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 5 | 10 | 15 | | | | | | | | | | | | |
| Gly | Glu | Thr | Ala | Leu | Gln | Cys | Ala | Ala | Leu | Thr | Asp | Asn | Val | Thr | Arg |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Ala | Cys | Tyr | Asp | Arg | Ile | Phe | Ala | Ala | Gln | Leu | Pro | Ser | Ser | Ala |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gly | Gln | Glu | Gly | Gln | Glu | Ser | Lys | Ala | Val | Leu | Asn | Leu | Thr | Glu | Thr |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Val | Arg | Ser | Ser | Leu | Asp | Lys | Gly | Glu | Ala | Val | Ile | Val | Val | Glu | Lys |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Gly | Asp | Ala | Leu | Pro | Ala | Asp | Ser | Ala | Gly | Glu | Thr | Ala | Asp | Ile |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Tyr | Thr | Pro | Leu | Ser | Leu | Met | Tyr | Asp | Leu | Asp | Lys | Asn | Asp | Leu | Arg |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Gly | Leu | Leu | Gly | Val | Arg | Glu | His | Asn | Pro | Met | Tyr | Leu | Met | Pro | Phe |
| | | 115 | | | | | 120 | | | | | | 125 | | |
| Trp | Tyr | Asn | Asn | Ser | Pro | Asn | Tyr | Ala | Pro | Ser | Ser | Pro | Thr | Arg | Gly |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Thr | Thr | Val | Gln | Glu | Lys | Phe | Gly | Gln | Gln | Lys | Arg | Ala | Glu | Thr | Lys |
| | 145 | | | | 150 | | | | | 155 | | | | | 160 |
| Leu | Gln | Val | Ser | Phe | Lys | Ser | Lys | Ile | Ala | Glu | Asn | Leu | Phe | Lys | Thr |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Arg | Ala | Asp | Leu | Trp | Phe | Gly | Tyr | Thr | Gln | Arg | Ser | Asp | Trp | Gln | Ile |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Tyr | Asn | Gln | Gly | Arg | Lys | Ser | Ala | Pro | Phe | Arg | Asn | Thr | Asp | Tyr | Lys |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Pro | Glu | Ile | Phe | Leu | Thr | Gln | Pro | Val | Lys | Ala | Asp | Leu | Pro | Phe | Gly |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Gly | Arg | Leu | Arg | Met | Leu | Gly | Ala | Gly | Phe | Val | His | Gln | Ser | Asn | Gly |
| | 225 | | | | 230 | | | | | 235 | | | | | 240 |
| Gln | Ser | Arg | Pro | Glu | Ser | Arg | Ser | Trp | Asn | Arg | Ile | Tyr | Ala | Met | Ala |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Gly | Met | Glu | Trp | Gly | Lys | Leu | Thr | Val | Ile | Pro | Arg | Val | Trp | Val | Arg |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Ala | Phe | Asp | Gln | Ser | Gly | Asp | Lys | Asn | Asp | Asn | Pro | Asp | Ile | Ala | Asp |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Tyr | Met | Gly | Tyr | Gly | Asp | Val | Lys | Leu | Gln | Tyr | Arg | Leu | Asn | Asp | Arg |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Gln | Asn | Val | Tyr | Ser | Val | Leu | Arg | Tyr | Asn | Pro | Lys | Thr | Gly | Tyr | Gly |

[illegible]

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Gln | Glu | Gly | Gln | Glu | Ser | Lys | Ala | Val | Leu | Asn | Leu | Thr | Glu | Thr |
| 50 | | | | | | 55 | | | | | 60 | | | | |
| Val | Arg | Ser | Ser | Leu | Asp | Lys | Gly | Glu | Ala | Val | Ile | Val | Val | Glu | Lys |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Gly | Asp | Ala | Leu | Pro | Ala | Asp | Ser | Ala | Gly | Glu | Thr | Ala | Asp | Ile |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Tyr | Thr | Pro | Leu | Ser | Leu | Met | Tyr | Asp | Leu | Asp | Lys | Asn | Asp | Leu | Arg |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Gly | Leu | Leu | Gly | Val | Arg | Glu | His | Asn | Pro | Met | Tyr | Leu | Met | Pro | Leu |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Trp | Tyr | Asn | Asn | Ser | Pro | Asn | Tyr | Ala | Pro | Gly | Ser | Pro | Thr | Arg | Gly |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Thr | Thr | Val | Gln | Glu | Lys | Phe | Gly | Gln | Gln | Lys | Arg | Ala | Glu | Thr | Lys |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Leu | Gln | Val | Ser | Phe | Lys | Ser | Lys | Ile | Ala | Glu | Asp | Leu | Phe | Lys | Thr |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Arg | Ala | Asp | Leu | Trp | Phe | Gly | Tyr | Thr | Gln | Arg | Ser | Asp | Trp | Gln | Ile |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Tyr | Asn | Gln | Gly | Arg | Lys | Ser | Ala | Pro | Phe | Arg | Asn | Thr | Asp | Tyr | Lys |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Pro | Glu | Ile | Phe | Leu | Thr | Gln | Pro | Val | Lys | Ala | Asp | Leu | Pro | Phe | Gly |
| | | 210 | | | | 215 | | | | | 220 | | | | |
| Gly | Arg | Leu | Arg | Met | Leu | Gly | Ala | Gly | Phe | Val | His | Gln | Ser | Asn | Gly |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Gln | Ser | Arg | Pro | Glu | Ser | Arg | Ser | Trp | Asn | Arg | Ile | Tyr | Ala | Met | Ala |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Gly | Met | Glu | Trp | Gly | Lys | Leu | Thr | Val | Ile | Pro | Arg | Val | Trp | Val | Arg |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Ala | Phe | Asp | Gln | Ser | Gly | Asp | Lys | Asn | Asp | Asn | Pro | Asp | Ile | Ala | Asp |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Tyr | Met | Gly | Tyr | Gly | Asp | Val | Lys | Leu | Gln | Tyr | Arg | Leu | Asn | Asp | Arg |
| | | | | | | 295 | | | | | 300 | | | | |
| Gln | Asn | Val | Tyr | Ser | Val | Leu | Arg | Tyr | Asn | Pro | Lys | Thr | Gly | Tyr | Gly |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Ala | Ile | Glu | Ala | Ala | Tyr | Thr | Phe | Pro | Ile | Lys | Gly | Lys | Leu | Lys | Gly |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Val | Val | Arg | Gly | Phe | His | Gly | Tyr | Gly | Glu | Ser | Leu | Ile | Asp | Tyr | Asn |
| | | | 340 | | | | | 345 | | | | | 350 | | |

His Lys Gln Asn Gly Ile Gly Ile Gly Leu Met Phe Asn Asp Leu Asp
 355 360 365

Gly Ile
 370

<210> 1789
 <211> 1113
 <212> DNA
 <213> Neisseria meningitidis

<400> 1789
 atgcgctata ttctttttgac aggactgttg ccgatggcat ccgcttttgg agagaccgcg 60
 ctgcaatgcg ccgctttgac ggacaatggt acgcgtttgg cgtgttacga caggattttt 120
 gcggcacagc ttccgtcttc ggacgggcag gaagggcagg agtcgaaagc cgtactcaat 180
 ctgacggaaa ccgtccgcag cagcctggat aagggcgagg cggtcattgt tgttgaaaaa 240
 ggcggggatg cgcttcctgc cgacagtgcg gccgaaaccg ccgacatcta tacgcctttg 300
 agcctgatgt acgacttgga caaaaacgat ttgcgcgggc tgttgggcgt acgcgaacac 360
 aatccgatgt accttatgcc gctctggtac aacaattcgc ccaactatgc cccgggttcg 420
 ccgacgcgcg gtacgactgt acaggaaaaa ttcggacagc agaaacgtgc ggaaaccaa 480
 ttgcagggtt cgttcaaaaag caaaattgcc gaagatttgt ttaaaaccgc gcgggatctg 540
 tggttcggct acacccaaag atccgattgg cagatttaca accaaggcag gaaatccgcg 600
 ccgttccgca atacggatta caaacctgaa attttcctga cccagcctgt gaaggcggat 660
 ttgcggttcg gcggcaggct gcgtatgctc ggtgcgggtt ttgtccacca gtccaacgga 720
 cagagccgct ccgaatcgcg ttcgtggaac aggatttacg ccattggcagg catggaatgg 780
 ggcaaatgga cggtgattcc gcgcgtgtgg gtgcgtgcgt tcgatcagag cggcgataaa 840
 aacgacaatc ccgatattgc cgactatatg gggatggcgc acgtgaagct gcagtaccgc 900
 ctgaacgaca ggcagaatgt gtattccgta ttgcgctaca atcccaaaac gggctacggc 960
 gcgattgaag ccgcctacac gtttcggatt aagggcaaac tcaaaggcgt ggtacgcgga 1020
 ttccacggtt acggcgagag cctgatcgac tacaaccaca agcagaacgg tatcggtatc 1080
 gggttgatgt tcaacgactt ggacggcatc tga 1113

<210> 1790
 <211> 370
 <212> PRT
 <213> Neisseria meningitidis

<400> 1790
 Met Arg Tyr Ile Leu Leu Thr Gly Leu Leu Pro Met Ala Ser Ala Phe
 1 5 10 15
 Gly Glu Thr Ala Leu Gln Cys Ala Ala Leu Thr Asp Asn Val Thr Arg
 20 25 30
 Leu Ala Cys Tyr Asp Arg Ile Phe Ala Ala Gln Leu Pro Ser Ser Ala
 35 40 45
 Gly Gln Glu Gly Gln Glu Ser Lys Ala Val Leu Asn Leu Thr Glu Thr
 50 55 60
 Val Arg Ser Ser Leu Asp Lys Gly Glu Ala Val Ile Val Val Glu Lys
 65 70 75 80
 Gly Gly Asp Ala Leu Pro Ala Asp Ser Ala Gly Glu Thr Ala Asp Ile
 85 90 95

Tyr Thr Pro Leu Ser Leu Met Tyr Asp Leu Asp Lys Asn Asp Leu Arg
 100 105 110
 Gly Leu Leu Gly Val Arg Glu His Asn Pro Met Tyr Leu Met Pro Leu
 115 120 125
 Trp Tyr Asn Asn Ser Pro Asn Tyr Ala Pro Gly Ser Pro Thr Arg Gly
 130 135 140
 Thr Thr Val Gln Glu Lys Phe Gly Gln Gln Lys Arg Ala Glu Thr Lys
 145 150 155 160
 Leu Gln Val Ser Phe Lys Ser Lys Ile Ala Glu Asp Leu Phe Lys Thr
 165 170 175
 Arg Ala Asp Leu Trp Phe Gly Tyr Thr Gln Arg Ser Asp Trp Gln Ile
 180 185 190
 Tyr Asn Gln Gly Arg Lys Ser Ala Pro Phe Arg Asn Thr Asp Tyr Lys
 195 200 205
 Pro Glu Ile Phe Leu Thr Gln Pro Val Lys Ala Asp Leu Pro Phe Gly
 210 215 220
 Gly Arg Leu Arg Met Leu Gly Ala Gly Phe Val His Gln Ser Asn Gly
 225 230 235 240
 Gln Ser Arg Pro Glu Ser Arg Ser Trp Asn Arg Ile Tyr Ala Met Ala
 245 250 255
 Gly Met Glu Trp Gly Lys Leu Thr Val Ile Pro Arg Val Trp Val Arg
 260 265 270
 Ala Phe Asp Gln Ser Gly Asp Lys Asn Asp Asn Pro Asp Ile Ala Asp
 275 280 285
 Tyr Met Gly Tyr Gly Asp Val Lys Leu Gln Tyr Arg Leu Asn Asp Arg
 290 295 300
 Gln Asn Val Tyr Ser Val Leu Arg Tyr Asn Pro Lys Thr Gly Tyr Gly
 305 310 315 320
 Ala Ile Glu Ala Ala Tyr Thr Phe Pro Ile Lys Gly Lys Leu Lys Gly
 325 330 335
 Val Val Arg Gly Phe His Gly Tyr Gly Glu Ser Leu Ile Asp Tyr Asn
 340 345 350
 His Lys Gln Asn Gly Ile Gly Ile Gly Leu Met Phe Asn Asp Leu Asp
 355 360 365
 Gly Ile
 370

<210> 1791

<211> 609
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1791
 atgataattg accaaagcca aatatttacc catcttgcct tctgtgcctt ttgcgggatt 60
 ggagccgtaa ctgccggcaa tcgactgcat aatcggatgt ataatgccgc cgccgcgcgc 120
 ggtattggaa ggggtaacgg gagccagcag cagttcggaa agagcgagac tgtaaccgat 180
 gccagcgtt tttcttccaa aaacggcgat aaacaaatat ccgatacgca tccccagccc 240
 tgttttgagc aaaccgcgcg aaatcataac tgcgatggca atcagccaaa tcaacggatt 300
 ggcgaaacga ctcaacgcat cgctcatcgc cgcgcccggg ttgtcggcgg ttacgccggg 360
 tactgcgacc aaccgcgacg caataatcga cagcgcgccc aacggcataa ccttgccgat 420
 aatggcggca atcacaccga caaacatagc cagcagcgtc caagcctgag gcttgacccc 480
 gtcgggtacg ggcagtgccg aaaccagggc gcacaatact gcggcaatgg cgaggggtat 540
 cggtttgaaa cccaatttca tcatattgac ctccgtaaaa aagaccgtcc cgaaaaatcg 600
 gaaaaataa 609

<210> 1792
 <211> 202
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1792
 Met Ile Ile Asp Gln Ser Gln Ile Phe Thr His Leu Ala Phe Cys Ala
 1 5 10 15
 Phe Cys Gly Ile Gly Ala Val Thr Ala Gly Asn Arg Leu His Asn Arg
 20 25 30
 Met Tyr Asn Ala Ala Ala Ala Arg Gly Ile Gly Arg Gly Asn Gly Ser
 35 40 45
 Gln Gln Gln Phe Gly Lys Ser Glu Thr Val Thr Asp Ala Gln Arg Phe
 50 55 60
 Ser Ser Lys Asn Gly Asp Lys Gln Ile Ser Asp Thr His Pro Gln Pro
 65 70 75 80
 Cys Phe Glu Gln Thr Ala Arg Asn His Asn Cys Asp Gly Asn Gln Pro
 85 90 95
 Asn Gln Arg Ile Gly Glu Arg Thr Gln Arg Ile Ala His Arg Arg Ala
 100 105 110
 Arg Phe Val Gly Gly Tyr Ala Gly Tyr Cys Asp Gln Pro Asp Gly Asn
 115 120 125
 Asn Arg Gln Arg Ala Gln Arg His Asn Leu Ala Asp Asn Gly Gly Asn
 130 135 140
 His Thr Asp Lys His Ser Gln Gln Arg Pro Ser Leu Arg Leu Asp Pro
 145 150 155 160
 Val Gly Tyr Gly Gln Cys Gln Asn Gln Gly Ala Gln Tyr Cys Gly Asn
 165 170 175

Gly Glu Gly Tyr Arg Phe Glu Thr Gln Phe His His Ile Asp Leu Arg
180 185 190

Lys Lys Asp Arg Pro Glu Lys Ser Glu Lys
195 200

<210> 1793

<211> 609

<212> DNA

<213> Neisseria meningitidis

<400> 1793

```
atgatagttg accaaagcca aatatttacc catcttgccct tctgtgcctt ttgcgggatt 60
ggagccgtaa ctgccggcaa tcgactgcat aatcggatgt ataatgccgc cgccgcgcgc 120
ggtattggaa ggggtaacgg gagccagcag cagttcggaa agagcgagac tgtaaccgat 180
gcccagcggt tttcttccaa aaacggcgat aaacaaatat ccgatacgca tccccagccc 240
tgttttgagc aaaccgcgcg aaatcataac tgcgatggca atcagccaaa tcaacggatt 300
ggcgaacgca ctcaacgcat cgctcatcgc cgcgcccggg ttgtcggcgg ttacgccgat 360
tactgcgacc aaccgcacgg caataatcga cagcgcgcc aacggcatgg ccttgccgat 420
aatggcggca atcacaccga caaacatggc cagcagcgtc caagcctgag gcttgacccc 480
gtcgggtacg ggcagtgccg aaaccagggc gcacaatact gcggcaatgg cgaggggtat 540
cggtttgaaa cccaatttca tcatattgac ctccgtaaaa aagaccgtcc cgaaaaatcg 600
gaaaaataa                                     609
```

<210> 1794

<211> 202

<212> PRT

<213> Neisseria meningitidis

<400> 1794

Met Ile Val Asp Gln Ser Gln Ile Phe Thr His Leu Ala Phe Cys Ala
1 5 10 15

Phe Cys Gly Ile Gly Ala Val Thr Ala Gly Asn Arg Leu His Asn Arg
20 25 30

Met Tyr Asn Ala Ala Ala Ala Arg Gly Ile Gly Arg Gly Asn Gly Ser
35 40 45

Gln Gln Gln Phe Gly Lys Ser Glu Thr Val Thr Asp Ala Gln Arg Phe
50 55 60

Ser Ser Lys Asn Gly Asp Lys Gln Ile Ser Asp Thr His Pro Gln Pro
65 70 75 80

Cys Phe Glu Gln Thr Ala Arg Asn His Asn Cys Asp Gly Asn Gln Pro
85 90 95

Asn Gln Arg Ile Gly Glu Arg Thr Gln Arg Ile Ala His Arg Arg Ala
100 105 110

Arg Phe Val Gly Gly Tyr Ala Gly Tyr Cys Asp Gln Pro Asp Gly Asn
115 120 125

Asn Arg Gln Arg Ala Gln Arg His Gly Leu Ala Asp Asn Gly Gly Asn

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 130 | | | | 135 | | | | 140 | | | | | | | |
| His | Thr | Asp | Lys | His | Gly | Gln | Gln | Arg | Pro | Ser | Leu | Arg | Leu | Asp | Pro |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Val | Gly | Tyr | Gly | Gln | Cys | Gln | Asn | Gln | Gly | Ala | Gln | Tyr | Cys | Gly | Asn |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Gly | Glu | Gly | Tyr | Arg | Phe | Glu | Thr | Gln | Phe | His | His | Ile | Asp | Leu | Arg |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Lys | Lys | Asp | Arg | Pro | Glu | Lys | Ser | Glu | Lys | | | | | | |
| | | 195 | | | | | 200 | | | | | | | | |

Asn Gln Arg Ile Gly Glu Arg Thr Gln Arg Ile Ala His Arg Arg Thr
 100 105 110

Arg Phe Val Gly Gly Tyr Ala Gly Tyr Cys Asp Gln Pro Asp Gly Asn
 115 120 125

Asn Arg Gln Arg Thr Gln Arg His Gly Leu Ala Asp Asn Gly Gly Asn
 130 135 140

His Thr Asp Lys His Gly Gln Gln Arg Pro Ser Leu Arg Leu Asp Pro
 145 150 155 160

Val Gly Tyr Gly Gln Cys Gln Asn Gln Gly Ala Gln Tyr Cys Gly Asn
 165 170 175

Gly Glu Gly Tyr Arg Phe Glu Thr Gln Phe His His Ile Asp Leu Arg
 180 185 190

Lys Lys Asp Arg Pro Glu Lys Ser Glu Lys
 195 200

<210> 1797

<211> 705

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1797

atgctgcggtt ctattttggc ggcttccctg ctggcggtat cttttccggc ggcggtgag 60
 gcattgaatt acaatattgt cgaattttcc gaatcggcgg gtatcgaggt ggctcaggat 120
 acaatgtccg cgcgtttcca ggtggcggcg gaaggacggg acaaaaatgc cgtcaatgcc 180
 gagtttggtta aaaaattcaa caatttcacc agaaaatcga aaaatggtag ctttaaaacc 240
 gaattggtat cgcgcagtgc gatgccgcgc tatcaatata ccaacggcag acgcattcaa 300
 acaggctggg aggagcgtgc ggaatttaag gcgaggggca gggattttga tgctttaaac 360
 cgtttttattg ctgatgttca gacggatgct tcgcttgaag ataccgattt cagcgtgtcg 420
 cgcgaacgcc gaaacgaggt catcgatcag gtcagcaagg atgccgtttt gcgtttcaag 480
 gcgcgtgccc aaaaactggc gggcgttctg ggtgcgtccg gttataaaat cgtcaaattg 540
 aattttgggc aaatcggcag ccatattgcg ggcgatgggg ctgttcgggc aaaaatgctg 600
 cgcgcgatgc cgatggcggc aagcgtcaat atgaagggtta cggattcagc cgcaccgggt 660
 gtggaggaaa tcagcatcag catcaatggg acggttcagt tctaa 705

<210> 1798

<211> 234

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1798

Met Leu Arg Ser Ile Leu Ala Ala Ser Leu Leu Ala Val Ser Phe Pro
 1 5 10 15

Ala Ala Ala Glu Ala Leu Asn Tyr Asn Ile Val Glu Phe Ser Glu Ser
 20 25 30

Ala Gly Ile Glu Val Ala Gln Asp Thr Met Ser Ala Arg Phe Gln Val

| | | |
|---|-----|-----|
| 35 | 40 | 45 |
| Ala Ala Glu Gly Arg Asp Lys Asn Ala Val Asn Ala Glu Phe Val Lys | | |
| 50 | 55 | 60 |
| Lys Phe Asn Asn Phe Thr Arg Lys Ser Lys Asn Gly Ser Phe Lys Thr | | |
| 65 | 70 | 75 |
| Glu Leu Val Ser Arg Ser Ala Met Pro Arg Tyr Gln Tyr Thr Asn Gly | | |
| | 85 | 90 |
| Arg Arg Ile Gln Thr Gly Trp Glu Glu Arg Ala Glu Phe Lys Ala Glu | | |
| | 100 | 105 |
| | | 110 |
| Gly Arg Asp Phe Asp Ala Leu Asn Arg Phe Ile Ala Asp Val Gln Thr | | |
| | 115 | 120 |
| | | 125 |
| Asp Ala Ser Leu Glu Asp Thr Asp Phe Ser Val Ser Arg Glu Arg Arg | | |
| | 130 | 135 |
| | | 140 |
| Asn Glu Val Ile Asp Gln Val Ser Lys Asp Ala Val Leu Arg Phe Lys | | |
| | 145 | 150 |
| | | 155 |
| Ala Arg Ala Glu Lys Leu Ala Gly Val Leu Gly Ala Ser Gly Tyr Lys | | |
| | 165 | 170 |
| | | 175 |
| Ile Val Lys Leu Asn Phe Gly Gln Ile Gly Ser His Ile Ala Gly Asp | | |
| | 180 | 185 |
| | | 190 |
| Gly Ala Val Arg Ala Lys Met Leu Arg Ala Met Pro Met Ala Ala Ser | | |
| | 195 | 200 |
| | | 205 |
| Val Asn Met Lys Gly Thr Asp Ser Ala Ala Pro Gly Val Glu Glu Ile | | |
| | 210 | 215 |
| | | 220 |
| Ser Ile Ser Ile Asn Gly Thr Val Gln Phe | | |
| 225 | 230 | |

<210> 1799

<211> 705

<212> DNA

<213> Neisseria meningitidis

<400> 1799

```

atgttgcgtc ttgttttggc ggcttcgctg tccggcggtat cttttccggc agcggctgaa 60
gcattgaatt acaatattgt cgaattttcc gaatcggcgg gtgtcgaggt ggctcaggat 120
acaatgtccg cacgtttcca agtgacggcg gaaggacggg acaaaaatgc cgtcaatgct 180
gagtttggtt aaaaattcaa caagttcatc agaaaatcga aaaatggtag ctttaaaacc 240
gaattggtat cgcgcagtcg gatgccgcgc tatcaatata ccaacggcag acgcattcaa 300
acaggctggg aggagcgtgc ggaatttaag gtcgaaggta gagattttga tgagttaaac 360
cgttttattg ccgatattca agcagatgcc gcgttggmat atacggattt ccatgtgtcg 420
cgcgaaacgcc gcaacgaggt catckatcag gtcagcaagg atgccgtttt gcgtttcaag 480
gcgcgtgccg aaaagttggc gggcgttttg ggtgcgtccg gttataaaat cgtcaaattg 540
aatttgggac acatcggcag ccatatcgcg ggagggggag ctgctcaggc aaaaatgctt 600
cgtgccatgc cgatggcggc aagcgtcaat atggagggtg cggattccgc cgcgcctggt 660

```

gtggaggaaa tcagcatcag cgtcaatggg acggttcagt tctga

705

<210> 1800

<211> 234

<212> PRT

<213> *Neisseria meningitidis*

<400> 1800

Met Leu Arg Leu Val Leu Ala Ala Ser Leu Ser Ala Val Ser Phe Pro
1 5 10 15

Ala Ala Ala Glu Ala Leu Asn Tyr Asn Ile Val Glu Phe Ser Glu Ser
20 25 30

Ala Gly Val Glu Val Ala Gln Asp Thr Met Ser Ala Arg Phe Gln Val
35 40 45

Thr Ala Glu Gly Arg Asp Lys Asn Ala Val Asn Ala Glu Phe Val Lys
50 55 60

Lys Phe Asn Lys Phe Ile Arg Lys Ser Lys Asn Gly Ser Phe Lys Thr
65 70 75 80

Glu Leu Val Ser Arg Ser Ala Met Pro Arg Tyr Gln Tyr Thr Asn Gly
85 90 95

Arg Arg Ile Gln Thr Gly Trp Glu Glu Arg Ala Glu Phe Lys Val Glu
100 105 110

Gly Arg Asp Phe Asp Glu Leu Asn Arg Phe Ile Ala Asp Ile Gln Ala
115 120 125

Asp Ala Ala Leu Xaa Tyr Thr Asp Phe His Val Ser Arg Glu Arg Arg
130 135 140

Asn Glu Val Ile Xaa Gln Val Ser Lys Asp Ala Val Leu Arg Phe Lys
145 150 155 160

Ala Arg Ala Glu Lys Leu Ala Gly Val Leu Gly Ala Ser Gly Tyr Lys
165 170 175

Ile Val Lys Leu Asn Leu Gly His Ile Gly Ser His Ile Ala Gly Gly
180 185 190

Gly Ala Ala Gln Ala Lys Met Leu Arg Ala Met Pro Met Ala Ala Ser
195 200 205

Val Asn Met Glu Gly Ala Asp Ser Ala Ala Pro Gly Val Glu Glu Ile
210 215 220

Ser Ile Ser Val Asn Gly Thr Val Gln Phe
225 230

<210> 1801

<211> 663

<212> DNA

<213> *Neisseria meningitidis*

<400> 1801

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atgttgcggt ctattttggc ggcttccttg ctgattgtcg aattttctga atcggcgggt 60
gtcgaaggcg ttcaggatac aatgtccgca cgtttccaag tgacggcgga aggacgggac 120
aaaaatgccg tcaatgccga gtttggttaa aaattcaaca atttcaccag aaaatcaaaa 180
aatggtagct ttaaaaccga attggtatcg cgcagtgcga tgccgcgcta tcaatatacc 240
aacggcagac gcattcaaac aggttgggag gagcgtgcgg aatttaaggt cgagggtagg 300
aattttgatg cgttgaaccg ttttattgcc gatgttcagg cagatgccgc gttggaatat 360
acggatttcc atgtgtcgcg cgaacgccgc aacgaggtca tcgatcaggt cagcaaggat 420
gccgttttgc gtttcaaggc gcgtgccgaa aagttggcgg gcgttttggg tgcgtccggt 480
tataaaatcg tcaaattgaa tttgggacac atcggcagcc atatcgcggg agggggagct 540
gctcaggcaa aaatgcttcg tgccatgccg atggcgcgaa gcgtcaatat ggagggtgcg 600
gattccgccg cgcctggtgt ggaggaaatc agcatcagcg tcaatgggac ggttcagttc 660
tga 663
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<210> 1802

<211> 220

<212> PRT

<213> *Neisseria meningitidis*

<400> 1802

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Met Leu Arg Ser Ile Leu Ala Ala Ser Leu Leu Ile Val Glu Phe Ser
 1             5             10             15

Glu Ser Ala Gly Val Glu Ala Val Gln Asp Thr Met Ser Ala Arg Phe
          20             25             30

Gln Val Thr Ala Glu Gly Arg Asp Lys Asn Ala Val Asn Ala Glu Phe
          35             40             45

Val Lys Lys Phe Asn Asn Phe Thr Arg Lys Ser Lys Asn Gly Ser Phe
 50             55             60

Lys Thr Glu Leu Val Ser Arg Ser Ala Met Pro Arg Tyr Gln Tyr Thr
 65             70             75             80

Asn Gly Arg Arg Ile Gln Thr Gly Trp Glu Arg Ala Glu Phe Lys
          85             90             95

Val Glu Gly Arg Asn Phe Asp Ala Leu Asn Arg Phe Ile Ala Asp Val
          100            105            110

Gln Ala Asp Ala Ala Leu Glu Tyr Thr Asp Phe His Val Ser Arg Glu
          115            120            125

Arg Arg Asn Glu Val Ile Asp Gln Val Ser Lys Asp Ala Val Leu Arg
          130            135            140

Phe Lys Ala Arg Ala Glu Lys Leu Ala Gly Val Leu Gly Ala Ser Gly
          145            150            155            160

Tyr Lys Ile Val Lys Leu Asn Leu Gly His Ile Gly Ser His Ile Ala
          165            170            175
```

Gly Gly Gly Ala Ala Gln Ala Lys Met Leu Arg Ala Met Pro Met Ala
180 185 190

Ala Ser Val Asn Met Glu Gly Ala Asp Ser Ala Ala Pro Gly Val Glu
195 200 205

Glu Ile Ser Ile Ser Val Asn Gly Thr Val Gln Phe
210 215 220

<210> 1803
<211> 696
<212> DNA
<213> Neisseria gonorrhoeae

<400> 1803
atgaaactgt tccaacgcat tttcgccaca ttttgcgcggt ttatcgtctg cgcaatcttt 60
gtggcgagtt tttctttttg gctggtgcag aacacccttg ccgaaaacca attcaaccaa 120
cgccgcacca tcgaaaccac attgatgggc agcattattt ccgcattcaa gacacggggc 180
gacaacggcg cgcgcgaaat cctgaccgaa tggaaaaaca gcccgtctc atccgccgtt 240
tacgtcatat agggcgacga gaaaaaagac atcttaaacc gctatatcga caattacacc 300
atagaacgcg cccggctggt tgcgcgcaac aacccccatt ccaaccttgt ccgcacgaa 360
tacgaccgtt tcggcgaaga atacctgttc ttcattaaag gctgggacaa ccaccaggca 420
caacgcctgc ccagcccgct gtttatcccg ggctgcgc ttgccccgat ttggcacgaa 480
ttcatcatcc tctccttcat catcattgtc ggactgctga tggcatatat ccttgccggc 540
aacattgcca aacccatcag aatcttaggc aacggcatgg acaggggtggc agaacgagaa 600
cttgaagacc gcgtttgcca acaggttcgc gaccgcgacg acgaattggc cgatgttgcc 660
atgcaattcg acacaatggt ggaaaaactg gaataa 696

<210> 1804
<211> 231
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1804
Met Lys Leu Phe Gln Arg Ile Phe Ala Thr Phe Cys Ala Val Ile Val
1 5 10 15

Cys Ala Ile Phe Val Ala Ser Phe Ser Phe Trp Leu Val Gln Asn Thr
20 25 30

Leu Ala Glu Asn Gln Phe Asn Gln Arg Arg Thr Ile Glu Thr Thr Leu
35 40 45

Met Gly Ser Ile Ile Ser Ala Phe Lys Thr Arg Gly Asp Asn Gly Ala
50 55 60

Arg Glu Ile Leu Thr Glu Trp Lys Asn Ser Pro Val Ser Ser Ala Val
65 70 75 80

Tyr Val Ile Gln Gly Asp Glu Lys Lys Asp Ile Leu Asn Arg Tyr Ile
85 90 95

Asp Asn Tyr Thr Ile Glu Arg Ala Arg Leu Phe Ala Ala Asn Asn Pro
100 105 110

His Ser Asn Leu Val Arg Ile Glu Tyr Asp Arg Phe Gly Glu Glu Tyr
115 120 125

Leu Phe Phe Ile Lys Gly Trp Asp Asn His Gln Ala Gln Arg Leu Pro
130 135 140

Ser Pro Leu Phe Ile Pro Gly Leu Pro Leu Ala Pro Ile Trp His Glu
145 150 155 160

Phe Ile Ile Leu Ser Phe Ile Ile Ile Val Gly Leu Leu Met Ala Tyr
165 170 175

Ile Leu Ala Gly Asn Ile Ala Lys Pro Ile Arg Ile Leu Gly Asn Gly
180 185 190

Met Asp Arg Val Ala Glu Arg Glu Leu Glu Asp Arg Val Cys Gln Gln
195 200 205

Val Arg Asp Arg Asp Asp Glu Leu Ala Asp Val Ala Met Gln Phe Asp
210 215 220

Thr Met Val Glu Lys Leu Glu
225 230

<210> 1805

<211> 1407

<212> DNA

<213> Neisseria meningitidis

<400> 1805

```
atgaaactgt tccaacgcat tttcgccaca ttttgcgcgg ttatcgtctg tgcaatcttt 60
gtggcgagtt tttctttctg gctggtgcag aacacccttg ccgaaaacca gttcaaccaa 120
cgccgcacca tcgaaaccac tttgatgggc agcatcattt ccgcattccg ggcacgcggg 180
gacgcgggtg cgcgcgaaat cctgacggaa tggaaagaca gccccgtctc atcgggcgtg 240
tacgttatac agggcgacga gaaaaaagat atcctgaacc ggtatatcga cagctataacc 300
atcgaacgcg ccgggctttt cgccgcgcga caccgcgatt ccaacctcgt ccataatcgaa 360
tacgaccgct tcggcggaaga atacctgttc ttcaccaaag actgggacaa actccaagcc 420
cgccgcctgc ccagccccct gttgatcccc ggctgcccgc tcgccccgat ttggcacgaa 480
ctcatcatat tgtccttcat catcatcgtc ggaçtgctga tggcatatat cctcgccggc 540
aacattgcc aacccatcag aatcttaggc aacggcatgg acaggggtgg aaacggagaa 600
cttgaaaccc gtatctccca acaggtcgac gacgcgcgac acgaattgtc ccattctgcc 660
atccaattcg acaaaatggt ggaaaaactc gaaaaactcg ttgccaaaga acgccacctg 720
ctccatcacg tctcccatga aatgcgttct ccccttgccg gcatgcaggc aattgtcgga 780
ctgattcagg cgcagcccca aaaacaggag caatatctca aacggctgga aggcgaactg 840
acccgcatgg atacgctggc cggggaactg ttaaccctgt ccggtctcga aacttccaat 900
atggctttgg aaaaagaaaag cctgaaaactc ctgccccttc tgggcaacct ggtagaagac 960
aatcaaagca ttgccagaaa aaacggacaa acggttaccc tgtctgccga cggaaaaatc 1020
cccgaaaaca caaccatcct tgccaacgaa agctacctgt accgcgcctt cgacaacgtc 1080
atccgcaacg ccgtcaacta cagtcccgaa ggcagcacca tctgatcaa catcggacaa 1140
gaccacaaac actggataat cgacgttacc gacaacggcc ccggcgtgga cgaaatgcag 1200
ctcccgcaca tcttcaccgc tttctaccgt gcagactcca gtgccaacaa acccggaaca 1260
ggactggggc ttgcattgac ccaacatatt attgaacagc actgcgga aatcatcgcc 1320
gaaaacatca aaccgaacgg tctgcggatg cgctttatcc tgcccaagaa aaaaaccggt 1380
tccaaaacag aaaaaagtgc gaactga 1407
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<210> 1806
<211> 468
<212> PRT
<213> Neisseria meningitidis

<400> 1806
Met Lys Leu Phe Gln Arg Ile Phe Ala Thr Phe Cys Ala Val Ile Val
1 5 10 15
Cys Ala Ile Phe Val Ala Ser Phe Ser Phe Trp Leu Val Gln Asn Thr
20 25 30
Leu Ala Glu Asn Gln Phe Asn Gln Arg Arg Thr Ile Glu Thr Thr Leu
35 40 45
Met Gly Ser Ile Ile Ser Ala Phe Arg Ala Arg Gly Asp Ala Gly Ala
50 55 60
Arg Glu Ile Leu Thr Glu Trp Lys Asp Ser Pro Val Ser Ser Gly Val
65 70 75 80
Tyr Val Ile Gln Gly Asp Glu Lys Lys Asp Ile Leu Asn Arg Tyr Ile
85 90 95
Asp Ser Tyr Thr Ile Glu Arg Ala Arg Leu Phe Ala Ala Gly His Pro
100 105 110
His Ser Asn Leu Val His Ile Glu Tyr Asp Arg Phe Gly Glu Glu Tyr
115 120 125
Leu Phe Phe Thr Lys Asp Trp Asp Lys Leu Gln Ala Arg Arg Leu Pro
130 135 140
Ser Pro Leu Leu Ile Pro Gly Leu Pro Leu Ala Pro Ile Trp His Glu
145 150 155 160
Leu Ile Ile Leu Ser Phe Ile Ile Ile Val Gly Leu Leu Met Ala Tyr
165 170 175
Ile Leu Ala Gly Asn Ile Ala Lys Pro Ile Arg Ile Leu Gly Asn Gly
180 185 190
Met Asp Arg Val Ala Asn Gly Glu Leu Glu Thr Arg Ile Ser Gln Gln
195 200 205
Val Asp Asp Arg Asp Asp Glu Leu Ser His Leu Ala Ile Gln Phe Asp
210 215 220
Lys Met Val Glu Lys Leu Glu Lys Leu Val Ala Lys Glu Arg His Leu
225 230 235 240
Leu His His Val Ser His Glu Met Arg Ser Pro Leu Ala Arg Met Gln
245 250 255
Ala Ile Val Gly Leu Ile Gln Ala Gln Pro Gln Lys Gln Glu Gln Tyr
260 265 270

Leu Lys Arg Leu Glu Gly Glu Leu Thr Arg Met Asp Thr Leu Ala Gly
 275 280 285
 Glu Leu Leu Thr Leu Ser Arg Leu Glu Thr Ser Asn Met Ala Leu Glu
 290 295 300
 Lys Glu Ser Leu Lys Leu Leu Pro Phe Leu Gly Asn Leu Val Glu Asp
 305 310 315 320
 Asn Gln Ser Ile Ala Gln Lys Asn Gly Gln Thr Val Thr Leu Ser Ala
 325 330 335
 Asp Gly Lys Ile Pro Glu Asn Thr Thr Ile Leu Ala Asn Glu Ser Tyr
 340 345 350
 Leu Tyr Arg Ala Phe Asp Asn Val Ile Arg Asn Ala Val Asn Tyr Ser
 355 360 365
 Pro Glu Gly Ser Thr Ile Leu Ile Asn Ile Gly Gln Asp His Lys His
 370 375 380
 Trp Ile Ile Asp Val Thr Asp Asn Gly Pro Gly Val Asp Glu Met Gln
 385 390 395 400
 Leu Pro His Ile Phe Thr Ala Phe Tyr Arg Ala Asp Ser Ser Ala Asn
 405 410 415
 Lys Pro Gly Thr Gly Leu Gly Leu Ala Leu Thr Gln His Ile Ile Glu
 420 425 430
 Gln His Cys Gly Lys Ile Ile Ala Glu Asn Ile Lys Pro Asn Gly Leu
 435 440 445
 Arg Met Arg Phe Ile Leu Pro Lys Lys Lys Thr Gly Ser Lys Thr Glu
 450 455 460
 Lys Ser Ala Asn
 465

<210> 1807

<211> 1407

<212> DNA

<213> *Neisseria meningitidis*

<400> 1807

atgaaactgt tccaacgcat cttcgccaca ttttgcgcggt ttatcgtctg tgcaatcttt 60
 gtggcgagtt tttctttctg gctggtgcag aacacccttg ccgaaaacca gttcaacca 120
 cgccgcacca tcgaaaccac tttgatgggc agcatcatTT ccgcattccg ggcacgcggg 180
 gacgcgggtg cgcgcgaaat cctgacggaa tggaaaagaca gccccgtctc atcgggctgt 240
 tacgttatac agggcgacga gaaaaaagat atcctgcacc ggtatatcga cagctacacc 300
 atcgaacgcg cccggctttt cgccgccgga caccgcatt ccaacctcgt ccatatcgaa 360
 tacgaccgct tcggcgaaga atacctgttc ttcaccaaag actgggacaa actccaagcc 420
 cgccgcctgc ccagccccct gttgatcccc ggctgcccgc tcgccccgat ttggcacgaa 480
 ctcacatcat tgtccttcat catcatcgtc ggactgctga tggcgtaac cctcgccggc 540
 aacattgcca aaccatcag aatcttaggc aacggcatgg acagggtggc aaacggagaa 600
 cttgaaaccc gtatctccca acaggtcgac gaccgcgacg acgaattgtc ccatcttgcc 660

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atccaattcg acaaaatggt ggaaaaactc gaaaaactcg ttgccaaaga acgccacctg 720
ctccatcacg tctcccatga aatgcgttct ccccttgccg gcatgcaggc aattgtcgga 780
ctgattcagg cgcagcccca aaaacaggag caatatctca aacggctgga aggcgaactg 840
acccgcatgg atacgctggc cggggaactg ttaaccctgt cccgtctcga aacttccaat 900
atggctttgg aaaaagaaag cctgaaactc ctgcccttcc tgggcaacct ggtagaagac 960
aatcaaagca ttgccagaa aaacggacaa acggttacct tgtctgccga cggaaaaatc 1020
cccgaaaaca caaccatcct tgccaacgaa agctacctgt accgcgcctt cgacaacgtc 1080
atccgcaacg ccgtcaacta cagtcccgaa ggcagcacca tcctgatcaa catcggacaa 1140
gaccacaaac actggataat cgacgttacc gacaacggcc ccggcgtgga cgaaatgcag 1200
ctcccgacac tcttcaccgc tttctaccgt gcagactoca gtgccaacaa acccggaaca 1260
ggactggggc ttgcattgac ccaacatatt attgaacagc actgcggcaa aatcatcgcc 1320
gaaaacatca aaccgaacgg tctgcggatg cgctttatcc tgcccaagaa aaaaaccggt 1380
tccaaaacag aaaaaagtgc gaactga 1407

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<210> 1808

<211> 468

<212> PRT

<213> *Neisseria meningitidis*

<400> 1808

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Met Lys Leu Phe Gln Arg Ile Phe Ala Thr Phe Cys Ala Val Ile Val
 1             5             10             15

Cys Ala Ile Phe Val Ala Ser Phe Ser Phe Trp Leu Val Gln Asn Thr
      20             25             30

Leu Ala Glu Asn Gln Phe Asn Gln Arg Arg Thr Ile Glu Thr Thr Leu
      35             40             45

Met Gly Ser Ile Ile Ser Ala Phe Arg Ala Arg Gly Asp Ala Gly Ala
      50             55             60

Arg Glu Ile Leu Thr Glu Trp Lys Asp Ser Pro Val Ser Ser Gly Val
      65             70             75             80

Tyr Val Ile Gln Gly Asp Glu Lys Lys Asp Ile Leu His Arg Tyr Ile
      85             90             95

Asp Ser Tyr Thr Ile Glu Arg Ala Arg Leu Phe Ala Ala Gly His Pro
      100            105            110

His Ser Asn Leu Val His Ile Glu Tyr Asp Arg Phe Gly Glu Glu Tyr
      115            120            125

Leu Phe Phe Thr Lys Asp Trp Asp Lys Leu Gln Ala Arg Arg Leu Pro
      130            135            140

Ser Pro Leu Leu Ile Pro Gly Leu Pro Leu Ala Pro Ile Trp His Glu
      145            150            155            160

Leu Ile Ile Leu Ser Phe Ile Ile Ile Val Gly Leu Leu Met Ala Tyr
      165            170            175

Ile Leu Ala Gly Asn Ile Ala Lys Pro Ile Arg Ile Leu Gly Asn Gly
      180            185            190

```

Met Asp Arg Val Ala Asn Gly Glu Leu Glu Thr Arg Ile Ser Gln Gln
 195 200 205
 Val Asp Asp Arg Asp Asp Glu Leu Ser His Leu Ala Ile Gln Phe Asp
 210 215 220
 Lys Met Val Glu Lys Leu Glu Lys Leu Val Ala Lys Glu Arg His Leu
 225 230 235 240
 Leu His His Val Ser His Glu Met Arg Ser Pro Leu Ala Arg Met Gln
 245 250 255
 Ala Ile Val Gly Leu Ile Gln Ala Gln Pro Gln Lys Gln Glu Gln Tyr
 260 265 270
 Leu Lys Arg Leu Glu Gly Glu Leu Thr Arg Met Asp Thr Leu Ala Gly
 275 280 285
 Glu Leu Leu Thr Leu Ser Arg Leu Glu Thr Ser Asn Met Ala Leu Glu
 290 295 300
 Lys Glu Ser Leu Lys Leu Leu Pro Phe Leu Gly Asn Leu Val Glu Asp
 305 310 315 320
 Asn Gln Ser Ile Ala Gln Lys Asn Gly Gln Thr Val Thr Leu Ser Ala
 325 330 335
 Asp Gly Lys Ile Pro Glu Asn Thr Thr Ile Leu Ala Asn Glu Ser Tyr
 340 345 350
 Leu Tyr Arg Ala Phe Asp Asn Val Ile Arg Asn Ala Val Asn Tyr Ser
 355 360 365
 Pro Glu Gly Ser Thr Ile Leu Ile Asn Ile Gly Gln Asp His Lys His
 370 375 380
 Trp Ile Ile Asp Val Thr Asp Asn Gly Pro Gly Val Asp Glu Met Gln
 385 390 395 400
 Leu Pro His Ile Phe Thr Ala Phe Tyr Arg Ala Asp Ser Ser Ala Asn
 405 410 415
 Lys Pro Gly Thr Gly Leu Gly Leu Ala Leu Thr Gln His Ile Ile Glu
 420 425 430
 Gln His Cys Gly Lys Ile Ile Ala Glu Asn Ile Lys Pro Asn Gly Leu
 435 440 445
 Arg Met Arg Phe Ile Leu Pro Lys Lys Lys Thr Gly Ser Lys Thr Glu
 450 455 460
 Lys Ser Ala Asn
 465

<210> 1809

<211> 630

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1809

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atggcagccc atctcgaaga acaacaagag ttagacaact ttaaataatt ttggaaaacc 60
acgggcaaat ggctgtttgc cctgctgatt ttggcggcac tcggctactt gggatacacg 120
gtttaccaaa accgtgcggc ttcccaaaat cagggaagcgg cggcgggtgct ggcaaacatc 180
gtggaaaagg cgcaaaaaca agccccgcaa agcgaaatca atgccgaact gtccaaactc 240
caacaaagct acccccattc catttcgcc gcccaagcca cgctgatggc ggcggcaacc 300
gaatttgacg cgcagcgtaa cgatgttgcc gaaggtcatt tgaaatgggt gttgtccaac 360
caaaaagaca gcctgattca ggcgttggcg gcgcagcgtc tgggcgttgt gttgttgcaa 420
caaaaaaat acgatgccgc gcttgccgca ctgcacacgc cggttgaggc ggacttcgcc 480
cccctgctga tggaaactaa aggcgatgtt tatgccgcac aggaaaaaag ccaggaagcc 540
ttaaaaaact acggacaggc ttggaaaaaa atgcctcaag attctgtcgg tcgcgaattg 600
cttcaaataa aactcgattc gctgaaataa 630
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<210> 1810

<211> 209

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1810

```
Met Ala Ala His Leu Glu Glu Gln Gln Glu Leu Asp Asn Phe Lys Tyr
  1                      5                      10                      15

Phe Trp Lys Thr Thr Gly Lys Trp Leu Phe Ala Leu Leu Ile Leu Ala
      20                      25                      30

Ala Leu Gly Tyr Leu Gly Tyr Thr Val Tyr Gln Asn Arg Ala Ala Ser
      35                      40                      45

Gln Asn Gln Glu Ala Ala Ala Val Leu Ala Asn Ile Val Glu Lys Ala
      50                      55                      60

Gln Asn Lys Ala Pro Gln Ser Glu Ile Asn Ala Glu Leu Ser Lys Leu
      65                      70                      75                      80

Gln Gln Ser Tyr Pro His Ser Ile Ser Ala Ala Gln Ala Thr Leu Met
      85                      90                      95

Ala Ala Ala Thr Glu Phe Asp Ala Gln Arg Tyr Asp Val Ala Glu Gly
      100                      105                      110

His Leu Lys Trp Val Leu Ser Asn Gln Lys Asp Ser Leu Ile Gln Ala
      115                      120                      125

Leu Ala Ala Gln Arg Leu Gly Val Val Leu Leu Gln Gln Lys Lys Tyr
      130                      135                      140

Asp Ala Ala Leu Ala Ala Leu Asp Thr Pro Val Glu Ala Asp Phe Ala
      145                      150                      155                      160

Pro Leu Leu Met Glu Thr Lys Gly Asp Val Tyr Ala Ala Gln Glu Lys
      165                      170                      175
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Ser Gln Glu Ala Leu Lys Asn Tyr Gly Gln Ala Leu Glu Lys Met Pro
 180 185 190

Gln Asp Ser Val Gly Arg Glu Leu Leu Gln Met Lys Leu Asp Ser Leu
 195 200 205

Lys

<210> 1811
 <211> 630
 <212> DNA
 <213> Neisseria meningitidis

<400> 1811
 atggcagccc atctcgaaga acaacaagag ttagacaact ttaaatattt ttggaaaacc 60
 acgggcaaat ggctgtttgc cttgctgatt ttggcggcac tcggctactt gggatacacg 120
 gtttaccaaa accgtaaagt ttcccaaaat caggaagcgg cggcgggtgct ggcaaaccatc 180
 gtagaaaagg cgcaaagcaa agccccgcaa agcgaaatca atgccgaatt gaccaaactc 240
 caacaaaagct acccgcattc catttccgcc gcccaagcca cactgatggc ggcggcaacc 300
 gaatttgacg cgcagcgtta cgatgttgcc gaaggccatt tgaaatgggt gttgtccaac 360
 caaaaagaca gcctgattca agcgttggcg gcgcagcgtc tgggcgttgt gttgttgcaa 420
 caaaaaaaat acgatgccgc gcttgccgcg ctcgatacgc cggttgaagc ggacttcgcc 480
 cccctgctga tggaaaccaa aggcgatgtc tatgcgcac agggaaaaag ccaggaagcc 540
 ttaaaaaact acggacaggc tttagaaaaa atgcctcaag attctgtcgg tcgcgaattg 600
 gttcaaatga aacttgattc gctgaaataa 630

<210> 1812
 <211> 209
 <212> PRT
 <213> Neisseria meningitidis

<400> 1812
 Met Ala Ala His Leu Glu Glu Gln Gln Glu Leu Asp Asn Phe Lys Tyr
 1 5 10 15
 Phe Trp Lys Thr Thr Gly Lys Trp Leu Phe Ala Leu Leu Ile Leu Ala
 20 25 30
 Ala Leu Gly Tyr Leu Gly Tyr Thr Val Tyr Gln Asn Arg Lys Val Ser
 35 40 45
 Gln Asn Gln Glu Ala Ala Ala Val Leu Ala Asn Ile Val Glu Lys Ala
 50 55 60
 Gln Ser Lys Ala Pro Gln Ser Glu Ile Asn Ala Glu Leu Thr Lys Leu
 65 70 75 80
 Gln Gln Ser Tyr Pro His Ser Ile Ser Ala Ala Gln Ala Thr Leu Met
 85 90 95
 Ala Ala Ala Thr Glu Phe Asp Ala Gln Arg Tyr Asp Val Ala Glu Gly
 100 105 110
 His Leu Lys Trp Val Leu Ser Asn Gln Lys Asp Ser Leu Ile Gln Ala

| | | |
|---------------------|-----------------------------|-----------------------------|
| 115 | 120 | 125 |
| Leu Ala Ala Gln Arg | Leu Gly Val Val | Leu Leu Gln Gln Lys Lys Tyr |
| 130 | 135 | 140 |
| Asp Ala Ala Leu Ala | Ala Leu Asp Thr Pro Val | Glu Ala Asp Phe Ala |
| 145 | 150 | 155 |
| Pro Leu Leu Met | Glu Thr Lys Gly Asp Val Tyr | Ala Ala Gln Gly Lys |
| | 165 | 170 |
| Ser Gln Glu Ala | Leu Lys Asn Tyr Gly Gln Ala | Leu Glu Lys Met Pro |
| | 180 | 185 |
| Gln Asp Ser Val | Gly Arg Glu Leu Val Gln Met | Lys Leu Asp Ser Leu |
| | 195 | 200 |
| | | 205 |

Lys

<210> 1813
 <211> 630
 <212> DNA
 <213> Neisseria meningitidis

<400> 1813
 atggcagccc atttggaaga acaacaagag ttggacaact ttaaataatatt ttggaaaacc 60
 acgggcaaat ggctgtttgc cgtgctgatt ttggcggcac tcggctactt gggatacacg 120
 gtttaccaaa accgtgcggc ttcccaaaat caggaagcgg cggcgggtgct ggcaaaccatc 180
 gtggaaaagg cgcaaaacaa agccccgcaa agcgaaatca atgccgaatt ggccaagctc 240
 caacaaagct acccccattc catttccgcc gcccaagcca cgctgatggc ggcagcaacc 300
 gaatttgacg cgcagcggtta cgtgttgcc gaaggccatt tgaaatgggt attgtccaac 360
 caaaaagaca gcctgatcca ggcgttggcg ggcagcgtc tgggcgttgt gttgttgcaa 420
 caaaaaaaat acgatgccg cttgtccgca ctgcacacgc cggttgaagc ggacttcgcc 480
 cccctgctga tggaaaccaa aggcgatgtc tatgccgcac agggaaaaag ccaggaagcc 540
 ttaaaaaact acggacaggc tttagaaaaa atgcctcaag attctgtcgg tcgcgaattg 600
 gttcaaatga aacttgattc gctgaaataa 630

<210> 1814
 <211> 209
 <212> PRT
 <213> Neisseria meningitidis

<400> 1814
 Met Ala Ala His Leu Glu Glu Gln Gln Glu Leu Asp Asn Phe Lys Tyr
 1 5 10 15
 Phe Trp Lys Thr Thr Gly Lys Trp Leu Phe Ala Val Leu Ile Leu Ala
 20 25 30
 Ala Leu Gly Tyr Leu Gly Tyr Thr Val Tyr Gln Asn Arg Ala Ala Ser
 35 40 45
 Gln Asn Gln Glu Ala Ala Ala Val Leu Ala Asn Ile Val Glu Lys Ala

| | | |
|---|-----|-------------|
| 50 | 55 | 60 |
| Gln Asn Lys Ala Pro Gln Ser Glu Ile Asn Ala Glu Leu Ala Lys Leu | | |
| 65 | 70 | 75 80 |
| Gln Gln Ser Tyr Pro His Ser Ile Ser Ala Ala Gln Ala Thr Leu Met | | |
| | 85 | 90 95 |
| Ala Ala Ala Thr Glu Phe Asp Ala Gln Arg Tyr Asp Val Ala Glu Gly | | |
| | 100 | 105 110 |
| His Leu Lys Trp Val Leu Ser Asn Gln Lys Asp Ser Leu Ile Gln Ala | | |
| | 115 | 120 125 |
| Leu Ala Ala Gln Arg Leu Gly Val Val Leu Leu Gln Gln Lys Lys Tyr | | |
| | 130 | 135 140 |
| Asp Ala Ala Leu Ala Ala Leu Asp Thr Pro Val Glu Ala Asp Phe Ala | | |
| | 145 | 150 155 160 |
| Pro Leu Leu Met Glu Thr Lys Gly Asp Val Tyr Ala Ala Gln Gly Lys | | |
| | 165 | 170 175 |
| Ser Gln Glu Ala Leu Lys Asn Tyr Gly Gln Ala Leu Glu Lys Met Pro | | |
| | 180 | 185 190 |
| Gln Asp Ser Val Gly Arg Glu Leu Val Gln Met Lys Leu Asp Ser Leu | | |
| | 195 | 200 205 |

Lys

<210> 1815
 <211> 543
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1815
 atgaaacgta tctttttgccc cgccttgccc gccatcctgc ctttatccgc ttatgccgac 60
 ctgcccttga cgattgaaga cataatgacc gacaagggaa aatggaaaact ggaaacttcc 120
 cttacctatc tgaatagcga aaacagccgc gccgcacttg ccgcaccggt ttacattcaa 180
 accggcgcaa cctcgtttat ccccatgccg accgaaattc aagaaaacgg cagcaatacc 240
 gatatgctcg ccggcacgct cggtttgccg tacggactga ccggcaatac cgacatttac 300
 ggcagcggca gctatctgtg gcacgaagaa cgaaaactcg acggcaacgg caaaacccgc 360
 aacaaacgga tgtccgacat atccgccggc atcagccaca ccttccttaa agacggcaaa 420
 aaccccgcgc taatcagctt tcttgaaagc acggtttacg aaaaatcgcg caacaaagcc 480
 tcgttaatca aaaaaagggg gctttgcccc tttataact taaggataaa ttatgaatat 540
 taa 543

<210> 1816
 <211> 180
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1816

Met Lys Arg Ile Phe Leu Pro Ala Leu Pro Ala Ile Leu Pro Leu Ser
1 5 10 15
Ala Tyr Ala Asp Leu Pro Leu Thr Ile Glu Asp Ile Met Thr Asp Lys
20 25 30
Gly Lys Trp Lys Leu Glu Thr Ser Leu Thr Tyr Leu Asn Ser Glu Asn
35 40 45
Ser Arg Ala Ala Leu Ala Ala Pro Val Tyr Ile Gln Thr Gly Ala Thr
50 55 60
Ser Phe Ile Pro Ile Pro Thr Glu Ile Gln Glu Asn Gly Ser Asn Thr
65 70 75 80
Asp Met Leu Ala Gly Thr Leu Gly Leu Arg Tyr Gly Leu Thr Gly Asn
85 90 95
Thr Asp Ile Tyr Gly Ser Gly Ser Tyr Leu Trp His Glu Glu Arg Lys
100 105 110
Leu Asp Gly Asn Gly Lys Thr Arg Asn Lys Arg Met Ser Asp Ile Ser
115 120 125
Ala Gly Ile Ser His Thr Phe Leu Lys Asp Gly Lys Asn Pro Ala Leu
130 135 140
Ile Ser Phe Leu Glu Ser Thr Val Tyr Glu Lys Ser Arg Asn Lys Ala
145 150 155 160
Ser Leu Ile Lys Lys Arg Gly Leu Cys Pro Phe Tyr Asn Leu Arg Ile
165 170 175
Asn Tyr Glu Tyr
180

<210> 1817

<211> 870

<212> DNA

<213> *Neisseria meningitidis*

<400> 1817

atgaagcgca tctttttgccc cgccttgccc gccatcctgc ctttatccac ttatgccgac 60
ctgcccttga cgattgaaga cataatgacc gacaagggaa aatggaaact ggaaacttcc 120
cttacctacc tgaacagcga aaacaaccgc gccgaacttg ccgcaccggt ttacattcaa 180
accggcgcaa cctcgtttat ccccatccg accgaaatcc aagaaaaacgg cagcaatacc 240
gatatgctcg tcggcacgct cggtttgctg tacggactga ccgggaatac cgacatttac 300
ggcagcggca gctatctgtg gcacgaagaa cgcaaactcg acggcaacag caaaaaccgc 360
aacaacgga tgtccgacgt atccctcggc atcagccaca ctttccttaa agacgacaaa 420
aaccgccccc taatcagctt tcttgaaagc acggtttacg aaaaatcgcg caacaaagcc 480
tcgtcgggaa aatcctggct catcggcgcc accacctaca aagccataga tccgattgtc 540
ctttccctca ccgccgccta ccgcatcaac ggagcaaaaa ccctttcaga cggcatccgc 600
tacaaatcgg gcaactacct gctgctcaac cccaacatct catttgctgc caacgacaga 660
atcagcctga ccggaggcat ccaatggctg ggagggcagc ccgaccggac ggacggcaaa 720
cgggaatcct ccagaaacac atccacctac gccatttcg gcgcaggttt cggtttcacc 780

aaaaccacgg ctttaaacgc atccgcacgt ttcaacgttt cagggcaaag cagttccgaa 840
 ctgaaatttg gcgtacagca tacattttaa 870

<210> 1818

<211> 770

<212> PRT

<213> Neisseria meningitidis

<400> 1818

Gly Asx Asx Phe Phe Phe Phe Phe Leu Phe Ala Leu Met Lys Arg Ile
 1 5 10 15

Phe Leu Pro Ala Leu Pro Ala Ile Leu Pro Leu Ser Thr Tyr Ala Asp
 20 25 30

Leu Pro Leu Thr Ile Glu Asp Ile Met Thr Asp Lys Gly Lys Trp Lys
 35 40 45

Leu Glu Thr Ser Leu Thr Tyr Leu Asn Ser Glu Asn Asn Arg Ala Glu
 50 55 60

Leu Ala Ala Pro Val Tyr Ile Gln Thr Gly Ala Thr Ser Phe Ile Pro
 65 70 75 80

Ile Pro Thr Glu Ile Gln Glu Asn Gly Ser Asn Thr Asp Met Leu Val
 85 90 95

Gly Thr Leu Gly Leu Arg Tyr Gly Leu Thr Gly Asn Thr Asp Ile Tyr
 100 105 110

Gly Ser Gly Ser Tyr Leu Trp His Glu Glu Arg Lys Leu Asp Gly Asn
 115 120 125

Ser Lys Thr Arg Asn Lys Arg Met Ser Asp Val Ser Leu Gly Ile Ser
 130 135 140

His Thr Phe Leu Lys Asp Asp Lys Asn Pro Ala Leu Ile Ser Phe Leu
 145 150 155 160

Glu Ser Thr Val Tyr Glu Lys Ser Arg Asn Lys Ala Ser Ser Gly Lys
 165 170 175

Ser Trp Leu Ile Gly Ala Thr Thr Tyr Lys Ala Ile Asp Pro Ile Val
 180 185 190

Leu Ser Leu Thr Ala Ala Tyr Arg Ile Asn Gly Ser Lys Thr Leu Ser
 195 200 205

Asp Gly Ile Arg Tyr Lys Ser Gly Asn Tyr Leu Leu Leu Asn Pro Asn
 210 215 220

Ile Ser Phe Ala Ala Asn Asp Arg Ile Ser Leu Thr Gly Gly Ile Gln
 225 230 235 240

Trp Leu Gly Arg Gln Pro Asp Arg Thr Asp Gly Lys Arg Glu Ser Ser
 245 250 255

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Asn | Thr | Ser | Thr | Tyr | Ala | His | Phe | Gly | Ala | Gly | Phe | Gly | Phe | Thr |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Lys | Thr | Thr | Ala | Leu | Asn | Ala | Ser | Ala | Arg | Phe | Asn | Val | Ser | Gly | Gln |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Cys | Tyr | Glx | Asn | Arg | Met | Ala | Leu | Met | His | Ala | Asp | Glu | Phe | Ala | Leu |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Thr | Pro | Ala | Arg | Ala | Gly | Arg | Ala | Pro | His | Phe | Asn | Thr | Asp | Asp | Ser |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Glu | Gln | Glu | Asn | Cys | Glu | Cys | Gln | His | Met | His | Asn | His | Ala | His | Trp |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| His | Lys | Ser | Glu | Arg | Val | Glu | Arg | Asp | Ala | Thr | Ala | Met | His | Cys | His |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Ile | Arg | Asn | Asx | Ser | Glu | Asp | Cys | Glx | Glx | Glx | Glx | Pro | Gly | Thr | Ile |
| | | 355 | | | | | 360 | | | | | 365 | | | |
| Met | Glu | Ser | Asn | Glu | Trp | Arg | Met | Ala | Asn | Ser | Tyr | Met | Asx | Leu | Ala |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Arg | Ile | Ala | Leu | Cys | Arg | Ile | Glu | Arg | Asn | Glu | Trp | His | Cys | Phe | Cys |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Phe | Met | Lys | Arg | Ile | Phe | Leu | Pro | Ala | Leu | Pro | Ala | Ile | Leu | Pro | Leu |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| Ser | Thr | Tyr | Ala | Asp | Leu | Pro | Leu | Thr | Ile | Glu | Asp | Ile | Met | Thr | Asp |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Lys | Gly | Lys | Trp | Lys | Leu | Glu | Thr | Ser | Leu | Thr | Tyr | Leu | Asn | Ser | Glu |
| | | 435 | | | | | 440 | | | | | 445 | | | |
| Asn | Asn | Arg | His | Lys | His | Lys | His | Asp | Pro | His | Pro | Xaa | Met | Lys | Arg |
| | 450 | | | | | 455 | | | | | 460 | | | | |
| Ile | Phe | Leu | Pro | Ala | Leu | Pro | Ala | Ile | Leu | Pro | Leu | Ser | Thr | Tyr | Ala |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 |
| Asp | Leu | Pro | Leu | Thr | Ile | Glu | Asp | Ile | Met | Thr | Asp | Lys | Gly | Lys | Trp |
| | | | | 485 | | | | | 490 | | | | | 495 | |
| Lys | Leu | Glu | Thr | Ser | Leu | Thr | Tyr | Leu | Asn | Ser | Glu | Asn | Asn | Arg | Met |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| His | Lys | Arg | Ile | Phe | His | Lys | Asn | Arg | Met | Ala | Leu | Phe | His | Lys | Leu |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Phe | Lys | Met | Ile | Cys | Arg | Ser | Phe | Thr | Trp | Arg | Asp | Ser | Ala | Ala | Asp |
| | 530 | | | | | 535 | | | | | 540 | | | | |
| Leu | His | Pro | Trp | Trp | Lys | Met | Asn | Phe | Met | Lys | Arg | Ile | Phe | Leu | Pro |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 |

Ala Leu Pro Ala Ile Leu Pro Leu Ser Thr Tyr Ala Asp Leu Pro Leu
565 570 575

Thr Ile Glu Asp Ile Met Thr Asp Lys Gly Lys Trp Lys Leu Glu Thr
580 585 590

Ser Leu Thr Tyr Leu Asn Ser Glu Asn Asn Arg Thr Ile Thr Leu Glu
595 600 605

Pro Ile Asp Gly Ile Asp Ala Asn Glu Ala Asp Asp Ala Glu Ala Cys
610 615 620

Asx Asp Cys Arg Thr Glu Asn Thr Arg Tyr Arg Glu Phe His Tyr Ala
625 630 635 640

Pro Ala Thr Ala Asx Leu Glu Trp Arg Asp Asp Cys Met Glu Asn Thr
645 650 655

Ser Met Met Ala Arg Tyr Ile Asn Phe Arg Met Ala Thr Ile Asn Asp
660 665 670

Cys Met Glu Asn Thr Ser Met Met Ala Arg Tyr Ile Asn Phe Arg Met
675 680 685

Phe Met Ile Cys Arg Ser Phe Thr Trp Arg Asp Asp Cys Met Glu Asn
690 695 700

Thr Met Ser Trp Arg Asp Asp Cys Trp Arg Asp Asp Cys Met Glu Asn
705 710 715 720

Thr Gln

<210> 1819
<211> 870
<212> DNA
<213> Neisseria meningitidis

<400> 1819
atgaagcgca tctttttgccc cgccttgccc gccatcctgc ctttatccgc ttatgccgac 60
ctgcccttga cgattgaaga cataatgacc gacaagggca aatggaaact ggaaacttcc 120
cttacctacc tgaacagcga aaacaaccgc gccgaacttg ccgcaccggt ttacatccaa 180
accggcgcaa cctcgtttat cccatttccg accgaaatcc aagaaaacgg cagcaatacc 240
gatatgctcg ttggcacgct cggtttgccg tacggactga ccgggaatac cgacatttac 300
ggcagcggga gctatctgtg gcacgaagaa cgaaaactcg acggcaacgg caaaacccga 360
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aaccocggcc taatcagctt tcttgaaagc acggtttacg aaaaatcgcg caacaaagcc 480
tcgtcgggaa aatcctggct catcggcgcc accacctaca aagccatcga ccccgctcgc 540
ctctcattga ccgctgccta ccgtatcaac ggcagcaaaa ccttttcaag caacacccaa 600
tacaagcag gcaattactg gatgctgaat cccaatatat ccttcgccgc caacgacaga 660
atcagcctca cgggcggcat ccaatggctg ggcaagcagc ccgaccgtct ggacggcaaa 720
aaagaatccg caagaaacac atccacctat gccatttctg gcgcagggtt cggtttcacc 780
aaaaccacgg ctttaaaccg atccgcacgt ttcaacgttt cagggcaaag cagttccgaa 840
ctgaaatttg gcgtacagca tacgttttaa 870

<210> 1820

<211> 289

<212> PRT

<213> Neisseria meningitidis

<400> 1820

Met Lys Arg Ile Phe Leu Pro Ala Leu Pro Ala Ile Leu Pro Leu Ser
1 5 10 15

Ala Tyr Ala Asp Leu Pro Leu Thr Ile Glu Asp Ile Met Thr Asp Lys
20 25 30

Gly Lys Trp Lys Leu Glu Thr Ser Leu Thr Tyr Leu Asn Ser Glu Asn
35 40 45

Asn Arg Ala Glu Leu Ala Ala Pro Val Tyr Ile Gln Thr Gly Ala Thr
50 55 60

Ser Phe Ile Pro Ile Pro Thr Glu Ile Gln Glu Asn Gly Ser Asn Thr
65 70 75 80

Asp Met Leu Val Gly Thr Leu Gly Leu Arg Tyr Gly Leu Thr Gly Asn
85 90 95

Thr Asp Ile Tyr Gly Ser Gly Ser Tyr Leu Trp His Glu Glu Arg Lys
100 105 110

Leu Asp Gly Asn Gly Lys Thr Arg Asn Lys Arg Met Ser Asp Val Ser
115 120 125

Leu Gly Ile Ser His Thr Phe Leu Lys Asp Asp Lys Asn Pro Ala Leu
130 135 140

Ile Ser Phe Leu Glu Ser Thr Val Tyr Glu Lys Ser Arg Asn Lys Ala
145 150 155 160

Ser Ser Gly Lys Ser Trp Leu Ile Gly Ala Thr Thr Tyr Lys Ala Ile
165 170 175

Asp Pro Val Val Leu Ser Leu Thr Ala Ala Tyr Arg Ile Asn Gly Ser
180 185 190

Lys Thr Leu Ser Ser Asn Thr Lys Tyr Lys Ala Gly Asn Tyr Trp Met
195 200 205

Leu Asn Pro Asn Ile Ser Phe Ala Ala Asn Asp Arg Ile Ser Leu Thr
210 215 220

Gly Gly Ile Gln Trp Leu Gly Lys Gln Pro Asp Arg Leu Asp Gly Lys
225 230 235 240

Lys Glu Ser Ala Arg Asn Thr Ser Thr Tyr Ala His Phe Gly Ala Gly
245 250 255

Phe Gly Phe Thr Lys Thr Thr Ala Leu Asn Ala Ser Ala Arg Phe Asn

260

265

270

Val Ser Gly Gln Ser Ser Ser Glu Leu Lys Phe Gly Val Gln His Thr
 275 280 285

Phe

<210> 1821

<211> 390

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1821

atgcttaaac atctcgatt cctactgccc gccatgatgt tcgccctccc cgcccagacc 60
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 gggcttcctt caggcaaagg catatggcgt tgcgggatg ggcgcgggta taccggttca 180
 ttcaaaaacg gcaaattcga cgggcaaggc gtttataccg ttgcgcgcgg ccgcgaagta 240
 tttctcgagc cgttcaattc cgacagtacc aaattccgca atatggcatt gtcgggcacg 300
 ttcaaacaag gcttggcaca cggcagggttc gccgcctcgc aaaacggcga aaccctcttt 360
 tattatgaaa tgcgaacacg gcatgattaa 390

<210> 1822

<211> 129

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1822

Met Leu Lys His Leu Ala Phe Leu Leu Pro Ala Met Met Phe Ala Leu
 1 5 10 15

Pro Ala Gln Thr Ala Val Leu Ser Pro Tyr Gln Glu Thr Gly Cys Thr
 20 25 30

Tyr Glu Gly Gly Ile Gly Lys Asp Gly Leu Pro Ser Gly Lys Gly Ile
 35 40 45

Trp Arg Cys Arg Asp Gly Arg Gly Tyr Thr Gly Ser Phe Lys Asn Gly
 50 55 60

Lys Phe Asp Gly Gln Gly Val Tyr Thr Val Ala Ala Gly Arg Glu Val
 65 70 75 80

Phe Leu Glu Pro Phe Asn Ser Asp Ser Thr Lys Phe Arg Asn Met Ala
 85 90 95

Leu Ser Gly Thr Phe Lys Gln Gly Leu Ala His Gly Arg Phe Ala Ala
 100 105 110

Ser Gln Asn Gly Glu Thr Leu Phe Tyr Tyr Glu Met Arg Thr Arg His
 115 120 125

Asp

<210> 1823
<211> 417
<212> DNA
<213> *Neisseria meningitidis*

<400> 1823
atgcttaaac atctcgcatc cctactgccc gccatgatgt tcgccctccc cacttcggcc 60
gccgtcctga cttcctatca agaaccaggc tgcacctacg acggcaatgt cggcaaagac 120
ggtaaaacccg ccggcaaagg cacatggcgc tgccaagacg ggcgcaacta taccggttcg 180
tttaaaaaacg gcaaattcga cgggcaaggc gtttataccg ttgccgcaa cgcgaaata 240
tttatcgaac cgttcaattc cgacagtacc aaattccgca acatggtact ctcgggcacg 300
ttcaaaaaag gcttggcaca cggcagattt accgtctcgc aaaacggcga aaccctcttc 360
attatgaaat gcgaaaacg catgattaa gaagtgaac tgcccaaaaa caaataa 417

<210> 1824
<211> 138
<212> PRT
<213> *Neisseria meningitidis*

<400> 1824
Met Leu Lys His Leu Ala Phe Leu Leu Pro Ala Met Met Phe Ala Leu
1 5 10 15
Pro Thr Ser Ala Ala Val Leu Thr Ser Tyr Gln Glu Pro Gly Cys Thr
20 25 30
Tyr Asp Gly Asn Val Gly Lys Asp Gly Lys Pro Ala Gly Lys Gly Thr
35 40 45
Trp Arg Cys Gln Asp Gly Arg Asn Tyr Thr Gly Ser Phe Lys Asn Gly
50 55 60
Lys Phe Asp Gly Gln Gly Val Tyr Thr Val Ala Ala Asn Arg Glu Ile
65 70 75 80
Phe Ile Glu Pro Phe Asn Ser Asp Ser Thr Lys Phe Arg Asn Met Val
85 90 95
Leu Ser Gly Thr Phe Lys Lys Gly Leu Ala His Gly Arg Phe Thr Val
100 105 110
Ser Gln Asn Gly Glu Thr Leu Phe Ile Met Lys Cys Glu Asn Gly Met
115 120 125
Ile Lys Glu Val Lys Leu Pro Lys Asn Lys
130 135

<210> 1825
<211> 417
<212> DNA
<213> *Neisseria meningitidis*

<400> 1825
atgcttaaac atctcgcatc cctactgccc gccatgatgt tcgccctccc cgccgcgtcc 60

gccgttctga cttcctatca agaaccggc tgcacctacg aaggcgatgt cggcaaagac 120
 ggtaaacccg ccggcaaagg cacatggcgc tgccaagacg ggcgcaacta taccggttcg 180
 tttaaaaatg gcaaattcga cggacaaggc gtttataccg ttgccgcaa cgcgaaaata 240
 tttatcgaac cgttcaattc cgacagtacc aaattccgca acatgggtact ctcgggcaca 300
 ttcaaaaaag gcttggcaca cggcagattt accgtctcgc aaaacggcga aaccctcttc 360
 attatgaaat gcgaaaacgg catgattaaa gaagtgaagc tgcccaaaaa caaataa 417

<210> 1826

<211> 138

<212> PRT

<213> *Neisseria meningitidis*

<400> 1826

Met Leu Lys His Leu Ala Phe Leu Leu Pro Ala Met Met Phe Ala Leu
 1 5 10 15

Pro Ala Ala Ser Ala Val Leu Thr Ser Tyr Gln Glu Pro Gly Cys Thr
 20 25 30

Tyr Glu Gly Asp Val Gly Lys Asp Gly Lys Pro Ala Gly Lys Gly Thr
 35 40 45

Trp Arg Cys Gln Asp Gly Arg Asn Tyr Thr Gly Ser Phe Lys Asn Gly
 50 55 60

Lys Phe Asp Gly Gln Gly Val Tyr Thr Val Ala Ala Asn Arg Glu Ile
 65 70 75 80

Phe Ile Glu Pro Phe Asn Ser Asp Ser Thr Lys Phe Arg Asn Met Val
 85 90 95

Leu Ser Gly Thr Phe Lys Lys Gly Leu Ala His Gly Arg Phe Thr Val
 100 105 110

Ser Gln Asn Gly Glu Thr Leu Phe Ile Met Lys Cys Glu Asn Gly Met
 115 120 125

Ile Lys Glu Val Lys Leu Pro Lys Asn Lys
 130 135

<210> 1827

<211> 2178

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1827

atgcaacaaa aaatccgttt ccaaatacgag gcgatgacct gtcaggcatg tgcttcgcgc 60
 attgaaaaag tgttgaacaa aaaagatttt gtcgaatcgg cgggagtga ctttgccagt 120
 gaggaagcgc aggttacgtt tgacggcagc aaaacctcgg ttgccgacat tgccaaaatc 180
 attgagaaaa ccggttacgg cgcgaaggaa aaaacggaag atacattgcc gcaacctgaa 240
 gcagaacacc atatcggtcg gcggttgtgg cttttgctga ccatcaatat cccgttcctt 300
 atcgggtatg tagggatgat gctaaaaggg ctgaattgga cacggcacga ttggatgatt 360
 ccgcctgtat ggcagtttgt actggcaagc atagtgaac tttggctggc aatcccgttt 420
 taaaaagcg cgtgggcaag cattaaaggc gggctggcga atatggacgt actcgttacc 480
 atcggcacgg tgtcgattta cctgtattcc gtttatatgc tgtttttcag ttcgcatgcg 540

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gcgcacggta tggcgcatgt gtattttgaa gcgggctga tggatgatcgg ttttgtgtcg 600
ctgggtaagt ttttggaaca ccgcacccaaa aaatccagcc tgaacagctt gggcttactg 660
ctaaaactca cgccgaccca agtcaacgtg caacgcaacg gcgaatggaa acaactgccc 720
atcgaccaag tgcaaatcgg cgaccttctc cgaccaacc acggcgaacg catcgctgcc 780
gacggcatta tcgaaagcgg cagcggttgg gcggacgaaa gccaccttac cggcgaatcc 840
aatcccgaag agaaaaaggc gggcggaaca gtgttgccgg gcgcgctgat gaccgaaggc 900
agcgtggtgt accgcgcgc gcagctcggc agccaaacc tgctcggcga catgatgaac 960
gcgctctctg aagcacaagg cagtaaagca ccgattgcgc gcgtggccga taaagcggcg 1020
gcggtatttg tgccaactgt cgtgggcctc gcgcttctga cttttatcgt tgcttggctg 1080
attaagggcg attggacggt cgcactgatg cagccggtt cggtttttgt gattgcctgc 1140
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aaacacggca tttggtttta agacgcggcg gcaatggagg aagcagccca cgtcgatgcc 1260
gtcgtatttg acaaaaccgg tacgctgacc gaaggcaggc cgcaggttgc cgccgtttat 1320
tacgttcccg acagcggctt tgacgaagac gctttgtacc gcatcgccgc cgccgtcgag 1380
caaaacgcgc cccaccgcgt cgcccgcgcc atcgctcccg ccgcacaagc gcgcggtttg 1440
gagattcccg ctgcacaaaa tgcgcaaac gttgtcggag caggcattac cgccgaagtg 1500
gaaggcgtgg gtttggtgaa atcaggcaaa gccgaatttg ccgaactgac cttgccgaag 1560
ttttcagacg gcgtttggga aatcgccagt gcggttaccg tatctgtaaa cggcaaaccg 1620
atcggcgcat tcgcactctc cgacgcgttg aaagccgata ccgccgaagc cataggccgt 1680
ctgaaaaaac acaatatcga tgtctatatt atgagcggcg ataaccaaag tacggtcgaa 1740
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gccgccgaag tgcagaaact caaagccgcc ggcaaaaccg tggcgatggt cggcgacggc 1860
atcaacgacg cgcccgcgct tgccgcgcc aacgtcagct tcgccatgaa aggcggtgcg 1920
gacgttgccg aacacaccgc ctccgccacg ctgatgcagc attcgggtcaa tcagctcgcc 1980
gatgccctgc tgatatcgca ggcaacgttg gaaaacatca agcaaaacct atttttcgcc 2040
ttcttctaca atatattggg cattccgctc gccgcgctcg gctttttaaa tcccgtcata 2100
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<210> 1828

<211> 725

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1828

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Met Gln Gln Lys Ile Arg Phe Gln Ile Glu Ala Met Thr Cys Gln Ala
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Cys Ala Ser Arg Ile Glu Lys Val Leu Asn Lys Lys Asp Phe Val Glu
      20              25              30

Ser Ala Gly Val Asn Phe Ala Ser Glu Glu Ala Gln Val Thr Phe Asp
      35              40              45

Gly Ser Lys Thr Ser Val Ala Asp Ile Ala Lys Ile Ile Glu Lys Thr
      50              55              60

Gly Tyr Gly Ala Lys Glu Lys Thr Glu Asp Thr Leu Pro Gln Pro Glu
      65              70              75              80

Ala Glu His His Ile Gly Trp Arg Leu Trp Leu Leu Leu Thr Ile Asn
      85              90              95

Ile Pro Phe Leu Ile Gly Met Val Gly Met Met Leu Lys Gly Leu Asn
      100             105             110

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Trp Thr Arg His Asp Trp Met Ile Pro Pro Val Trp Gln Phe Val Leu
 115 120 125

Ala Ser Ile Val Gln Leu Trp Leu Ala Ile Pro Phe Tyr Lys Ser Ala
 130 135 140

Trp Ala Ser Ile Lys Gly Gly Leu Ala Asn Met Asp Val Leu Val Thr
 145 150 155 160

Ile Gly Thr Val Ser Ile Tyr Leu Tyr Ser Val Tyr Met Leu Phe Phe
 165 170 175

Ser Ser His Ala Ala His Gly Met Ala His Val Tyr Phe Glu Ala Gly
 180 185 190

Val Met Val Ile Gly Phe Val Ser Leu Gly Lys Phe Leu Glu His Arg
 195 200 205

Thr Lys Lys Ser Ser Leu Asn Ser Leu Gly Leu Leu Leu Lys Leu Thr
 210 215 220

Pro Thr Gln Val Asn Val Gln Arg Asn Gly Glu Trp Lys Gln Leu Pro
 225 230 235 240

Ile Asp Gln Val Gln Ile Gly Asp Leu Ile Arg Thr Asn His Gly Glu
 245 250 255

Arg Ile Ala Ala Asp Gly Ile Ile Glu Ser Gly Ser Gly Trp Ala Asp
 260 265 270

Glu Ser His Leu Thr Gly Glu Ser Asn Pro Glu Glu Lys Lys Ala Gly
 275 280 285

Gly Lys Val Leu Ala Gly Ala Leu Met Thr Glu Gly Ser Val Val Tyr
 290 295 300

Arg Ala Ala Gln Leu Gly Ser Gln Thr Leu Leu Gly Asp Met Met Asn
 305 310 315 320

Ala Leu Ser Glu Ala Gln Gly Ser Lys Ala Pro Ile Ala Arg Val Ala
 325 330 335

Asp Lys Ala Ala Ala Val Phe Val Pro Thr Val Val Gly Ile Ala Leu
 340 345 350

Leu Thr Phe Ile Val Ala Trp Leu Ile Lys Gly Asp Trp Thr Val Ala
 355 360 365

Leu Met His Ala Val Ala Val Leu Val Ile Ala Cys Pro Cys Ala Leu
 370 375 380

Gly Leu Ala Thr Pro Ala Ala Ile Met Val Gly Met Gly Lys Ala Val
 385 390 395 400

Lys His Gly Ile Trp Phe Lys Asp Ala Ala Ala Met Glu Glu Ala Ala
 405 410 415

His Val Asp Ala Val Val Leu Asp Lys Thr Gly Thr Leu Thr Glu Gly
 420 425 430

Arg Pro Gln Val Ala Ala Val Tyr Tyr Val Pro Asp Ser Gly Phe Asp
 435 440 445

Glu Asp Ala Leu Tyr Arg Ile Ala Ala Ala Val Glu Gln Asn Ala Ala
 450 455 460

His Pro Leu Ala Arg Ala Ile Val Ser Ala Ala Gln Ala Arg Gly Leu
 465 470 475 480

Glu Ile Pro Ala Ala Gln Asn Ala Gln Thr Val Val Gly Ala Gly Ile
 485 490 495

Thr Ala Glu Val Glu Gly Val Gly Leu Val Lys Ser Gly Lys Ala Glu
 500 505 510

Phe Ala Glu Leu Thr Leu Pro Lys Phe Ser Asp Gly Val Trp Glu Ile
 515 520 525

Ala Ser Ala Val Thr Val Ser Val Asn Gly Lys Pro Ile Gly Ala Phe
 530 535 540

Ala Leu Ser Asp Ala Leu Lys Ala Asp Thr Ala Glu Ala Ile Gly Arg
 545 550 555 560

Leu Lys Lys His Asn Ile Asp Val Tyr Ile Met Ser Gly Asp Asn Gln
 565 570 575

Ser Thr Val Glu Tyr Val Ala Lys Gln Leu Gly Ile Ala His Ala Phe
 580 585 590

Gly Asn Met Ser Pro Cys Asp Lys Ala Ala Glu Val Gln Lys Leu Lys
 595 600 605

Ala Ala Gly Lys Thr Val Ala Met Val Gly Asp Gly Ile Asn Asp Ala
 610 615 620

Pro Ala Leu Ala Ala Ala Asn Val Ser Phe Ala Met Lys Gly Gly Ala
 625 630 635 640

Asp Val Ala Glu His Thr Ala Ser Ala Thr Leu Met Gln His Ser Val
 645 650 655

Asn Gln Leu Ala Asp Ala Leu Leu Ile Ser Gln Ala Thr Leu Glu Asn
 660 665 670

Ile Lys Gln Asn Leu Phe Phe Ala Phe Phe Tyr Asn Ile Leu Gly Ile
 675 680 685

Pro Leu Ala Ala Leu Gly Phe Leu Asn Pro Val Ile Ala Gly Ala Ala
 690 695 700

Met Ala Ala Ser Ser Val Ser Val Leu Gly Asn Ala Leu Arg Leu Lys
 705 710 715 720

Trp Val Lys Ile Asp
725

<210> 1829
<211> 2163
<212> DNA
<213> *Neisseria meningitidis*

<400> 1829
atgcaacaaa aaatccgttt ccaaatacgaa ggcatagacct gccaggcctg cgcttcgcgc 60
attgaaaaag tgttgaacaa aaaagatttt gtcgaatcgg cgggggtaaa cttcgccagc 120
gaagaggcgc aggtagtgtt tgacgacagc aaaacctcag tagccgacat tgccaaaatc 180
attgagaaaa ccggttacgg cgcgaaaggaa aaaacggaag atacattgcc gcaacccgaa 240
gcagaacacc atatcggtcg gcggtgtgtg ctgctgttca ccatcaacgt cccgttcctt 300
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ttcgcatagg caagcgtggt gcagcttttg ctggcaatcc cgttttacia aagcgcgtgg 420
gcgagcatta agggcgact ggcgaatatg gacgtgctgg ttaccatcgg cagcgtctcg 480
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catgtgtatt ttgaagtgg cggtgatggcg atcggttttg tgtcaactggg taaatttttg 600
gaacaccgta ccaaaaaatc cagcctcaac agcttgggct tgcgtctca acttacacca 660
acccaagtca acgtgcaacg caacggcgaa tggaaacagc ttcccatcga ccaagtgcga 720
atcggcgacc ttatccgcgc caaccacggc gaacgcattg ccgcagacgg catcattgaa 780
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gtgaaagcag gcaaagccga atttgccgaa ctggccttgc cgaagttttt agacggcggt 1560
tgggatattg caagcattgt tgcggtctca gtcgataaca aaccatcgg cgcattcgca 1620
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tag 2163

<210> 1830
<211> 720
<212> PRT
<213> *Neisseria meningitidis*

<400> 1830
Met Gln Gln Lys Ile Arg Phe Gln Ile Glu Gly Met Thr Cys Gln Ala
1 5 10 15

Cys Ala Ser Arg Ile Glu Lys Val Leu Asn Lys Lys Asp Phe Val Glu
 20 25 30

Ser Ala Gly Val Asn Phe Ala Ser Glu Glu Ala Gln Val Val Phe Asp
 35 40 45

Asp Ser Lys Thr Ser Val Ala Asp Ile Ala Lys Ile Ile Glu Lys Thr
 50 55 60

Gly Tyr Gly Ala Lys Glu Lys Thr Glu Asp Thr Leu Pro Gln Pro Glu
 65 70 75 80

Ala Glu His His Ile Gly Trp Arg Leu Trp Leu Leu Phe Thr Ile Asn
 85 90 95

Val Pro Phe Leu Ile Gly Met Ala Gly Met Met Ile Gly Arg His Asp
 100 105 110

Trp Met Ile Pro Pro Leu Trp Gln Phe Ala Leu Ala Ser Val Val Gln
 115 120 125

Leu Trp Leu Ala Ile Pro Phe Tyr Lys Ser Ala Trp Ala Ser Ile Lys
 130 135 140

Gly Gly Leu Ala Asn Met Asp Val Leu Val Thr Ile Gly Thr Val Ser
 145 150 155 160

Ile Tyr Leu Tyr Ser Val Tyr Met Leu Phe Phe Ser Pro His Ala Ala
 165 170 175

Tyr Gly Met Ala His Val Tyr Phe Glu Val Gly Val Met Val Ile Gly
 180 185 190

Phe Val Ser Leu Gly Lys Phe Leu Glu His Arg Thr Lys Lys Ser Ser
 195 200 205

Leu Asn Ser Leu Gly Leu Leu Leu Lys Leu Thr Pro Thr Gln Val Asn
 210 215 220

Val Gln Arg Asn Gly Glu Trp Lys Gln Leu Pro Ile Asp Gln Val Gln
 225 230 235 240

Ile Gly Asp Leu Ile Arg Ala Asn His Gly Glu Arg Ile Ala Ala Asp
 245 250 255

Gly Ile Ile Glu Ser Gly Ser Gly Trp Ala Asp Glu Ser His Leu Thr
 260 265 270

Gly Glu Ser Asn Pro Glu Glu Lys Lys Ala Gly Gly Lys Val Leu Ala
 275 280 285

Gly Ala Leu Met Thr Glu Gly Ser Val Val Tyr Arg Ala Thr Gln Leu
 290 295 300

Gly Ser Gln Thr Gln Leu Gly Asp Met Met Asn Ala Leu Ser Glu Ala
 305 310 315 320

Gln Gly Ser Lys Ala Pro Ile Ala Arg Val Ala Asp Lys Ala Ala Ala
 325 330 335

Val Phe Val Pro Ala Val Val Gly Ile Ala Leu Leu Thr Phe Ile Val
 340 345 350

Thr Trp Leu Ile Lys Gly Asp Trp Thr Val Ala Leu Met His Ala Val
 355 360 365

Ala Val Leu Val Ile Ala Cys Pro Cys Ala Leu Gly Leu Ala Thr Pro
 370 375 380

Ala Ala Ile Met Val Gly Met Gly Lys Ala Val Lys His Gly Ile Trp
 385 390 395 400

Phe Lys Asp Ala Ala Ala Met Glu Glu Ala Ala His Val Asp Ala Val
 405 410 415

Val Leu Asp Lys Thr Gly Thr Leu Thr Glu Gly Ser Pro Gln Val Ala
 420 425 430

Ala Val Tyr Cys Val Pro Asp Ser Gly Phe Asp Glu Asp Ala Leu Tyr
 435 440 445

Arg Ile Ala Ala Ala Val Glu Gln Asn Ala Ala His Pro Leu Ala Arg
 450 455 460

Ala Ile Val Ser Ala Ala Gln Ala Arg Gly Leu Asp Ile Pro Ala Ala
 465 470 475 480

Gln Asn Ala Gln Thr Val Val Gly Ala Gly Ile Thr Ala Glu Val Glu
 485 490 495

Gly Val Gly Leu Val Lys Ala Gly Lys Ala Glu Phe Ala Glu Leu Ala
 500 505 510

Leu Pro Lys Phe Leu Asp Gly Val Trp Asp Ile Ala Ser Ile Val Ala
 515 520 525

Val Ser Val Asp Asn Lys Pro Ile Gly Ala Phe Ala Leu Ala Asp Ala
 530 535 540

Leu Lys Ala Asp Thr Ala Glu Ala Ile Gly Arg Leu Lys Lys His Asn
 545 550 555 560

Ile Asp Val Tyr Ile Met Ser Gly Asp Asn Gln Gly Thr Val Glu Tyr
 565 570 575

Val Ala Lys Gln Leu Gly Ile Ala His Ala Phe Gly Asn Met Ser Pro
 580 585 590

Arg Asp Lys Ala Ala Glu Val Gln Lys Leu Lys Ala Ala Gly Lys Thr
 595 600 605

Val Ala Met Val Gly Asp Gly Ile Asn Asp Ala Pro Ala Leu Ala Ala
 610 615 620

Ala Asn Val Ser Phe Ala Met Lys Gly Gly Ala Asp Val Ala Glu His
625 630 635 640

Thr Ala Ser Ala Thr Leu Met Gln His Ser Val Asn Gln Leu Ala Asp
645 650 655

Ala Leu Leu Val Ser Gln Ala Thr Leu Lys Asn Ile Lys Gln Asn Leu
660 665 670

Phe Phe Ala Phe Phe Tyr Asn Ile Leu Gly Ile Pro Leu Ala Ala Leu
675 680 685

Gly Phe Leu Asn Pro Val Ile Ala Gly Ala Ala Met Ala Ala Ser Ser
690 695 700

Val Ser Val Leu Ser Asn Ala Leu Arg Leu Lys Arg Val Lys Ile Asp
705 710 715 720

<210> 1831
<211> 2178
<212> DNA
<213> Neisseria meningitidis

<400> 1831
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attgaaaaag tgttgaacaa aaaagatttt gtcgaatcgg cgggggtaaa ctccgccagc 120
gaagaggctc aggtagtgtt tgacgacagc aaaacctcag tagccgacat tgccaaaatc 180
attgagaaaa ccggttacgg cgcgaaaggaa aaaacggaag atacattgcc gcaacccgaa 240
gcagaacacc atatcggtcg gaggttgtgg cttttgctgg ccatcaatat cccgttcctt 300
atcggtatgg tagggatgat gctaaaaggg ctgaattgga cacggcatga ttggatgttg 360
tcgcccttgt tgcagtttgc attggcgagt gtggtgcagc tttggctggc ggtgccattt 420
tacaaaagcg cgtgggcgag cattaaggc gggctggcga atatggacgt actcgttacc 480
atcggcacgg tctcgattta cctgtattcc gtctatatgc tgtttttcag ccgcacgcgc 540
gcgtacggta tggcgcatgt gtattttgaa gtaggcataa tgggtgattgg ttttgtgtca 600
ctgggtaaat ttttggaaca ccgcacccaaa aaatccagcc tgaacagctt gggcttgctg 660
ctcaaaactca cgccaaccca agtcaacgtg caacgcgatg gcgaatggcg gcagctaccc 720
atcgaccaag tgcaaatcgg cgacctaatc cgcgcgaatc acggcgaacg cattgccgcc 780
gacggcatca tagaaagcgg cagcggctgg gcggacgaaa gccatcttac cggcgaatcc 840
aatcccgaag agaaaaaggc aggcggcaaa gtattggcgg gcgcgctgat gactgaaggc 900
agcgtggtgt accgcgcgcg gcagctcggc agccaaaccc tgctcggcga catgatgaac 960
gcgctctccg aagcgcaagg cagtaaagca ccgattgcgc gtgtggcgga caaggcggcg 1020
gcggtattcg tgctgcccgt tgtgggcacg gcacttttga cttttatcgc tacttggctg 1080
attaaggggc attggacgct cgcattgatg cacgcgcgtc ccgttttggt gattgcctgc 1140
ccgtgtgcac tcggtttggc aaccctgct gcgattatgg tcggtatggg caaagcgggt 1200
aaacacggta tttggtttta agacgcggca gcaatggaag aagccgcca cgttgatgcc 1260
gtcgtgctgg acaaaaccgg cacgtgacc gaaggcaagc cgcaggttg cgcggtttat 1320
tgtgttcccg acagcggtt tgacgaagac gctttgtacc gcacgcgcgc cgcgctcgaa 1380
caaaacgcgc cccatccgct cgcccggtgc atcgtctccg ccgcccaggc gcgcggtttg 1440
gagattccca ccgcacaaaa tgcccaaacc attgtcggcg cgggcattac cgcggaagta 1500
aaaggcgcgg gtttggtaaa agcaggcaaa gccgaatttg ccgaactgac cttgccgaag 1560
ttttcagacg gcgtttggga aatcgccagt gtggttgccg tatctgtaaa cggcaaacct 1620
atcggcgcat tcgcactcgc cgacgcgttg aaagccgata ccgcccgaag cataggccgt 1680

```

ctgaaaaaac acaatatcga tgtctatatt atgagcggcg ataaccaagg cacggtcgag 1740
tacgtcgcca aacaactggg catcgcacac gccttcggta atatgagtcg gcgcgacaaa 1800
gccgcgaag tgcagaaact caaagccgcc ggcaaaaccg tggcgatggt cggcgacggc 1860
atcaacgacg cgcgcgcgct cgcgcgcgcc aacgtcagct tcgccatgaa aggcgggtgca 1920
gacgttgccg aacacaccgc atccgccaca ctgatgcagc attcgggtcaa ccagctcgcc 1980
gatgcgctat cggtatcgcg agcgacgttg aaaaacatca agcaaaacct gtttttcgcc 2040
ttctttctaca atattttggg cattccgctc gccgcgctcg gcttttttaa ccccgtcatc 2100
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cgggtaaaaa tcgattga                                     2178

```

<210> 1832

<211> 725

<212> PRT

<213> Neisseria meningitidis

<400> 1832

```

Met Gln Gln Lys Val Arg Phe Gln Ile Glu Gly Met Thr Cys Gln Ala
  1                      5                      10                      15

```

```

Cys Ala Ser Arg Ile Glu Lys Val Leu Asn Lys Lys Asp Phe Val Glu
                20                      25                      30

```

```

Ser Ala Gly Val Asn Phe Ala Ser Glu Glu Ala Gln Val Val Phe Asp
          35                      40                      45

```

```

Asp Ser Lys Thr Ser Val Ala Asp Ile Ala Lys Ile Ile Glu Lys Thr
          50                      55                      60

```

```

Gly Tyr Gly Ala Lys Glu Lys Thr Glu Asp Thr Leu Pro Gln Pro Glu
          65                      70                      75                      80

```

```

Ala Glu His His Ile Gly Trp Arg Leu Trp Leu Leu Leu Ala Ile Asn
                85                      90                      95

```

```

Ile Pro Phe Leu Ile Gly Met Val Gly Met Met Leu Lys Gly Leu Asn
          100                      105                      110

```

```

Trp Thr Arg His Asp Trp Met Leu Ser Pro Leu Leu Gln Phe Ala Leu
          115                      120                      125

```

```

Ala Ser Val Val Gln Leu Trp Leu Ala Val Pro Phe Tyr Lys Ser Ala
          130                      135                      140

```

```

Trp Ala Ser Ile Lys Gly Gly Leu Ala Asn Met Asp Val Leu Val Thr
          145                      150                      155                      160

```

```

Ile Gly Thr Val Ser Ile Tyr Leu Tyr Ser Val Tyr Met Leu Phe Phe
          165                      170                      175

```

```

Ser Pro His Ala Ala Tyr Gly Met Ala His Val Tyr Phe Glu Val Gly
          180                      185                      190

```

```

Ile Met Val Ile Gly Phe Val Ser Leu Gly Lys Phe Leu Glu His Arg
          195                      200                      205

```

```

Thr Lys Lys Ser Ser Leu Asn Ser Leu Gly Leu Leu Leu Lys Leu Thr

```

210 215 220
 Pro Thr Gln Val Asn Val Gln Arg Asp Gly Glu Trp Arg Gln Leu Pro
 225 230 235 240
 Ile Asp Gln Val Gln Ile Gly Asp Leu Ile Arg Ala Asn His Gly Glu
 245 250 255
 Arg Ile Ala Ala Asp Gly Ile Ile Glu Ser Gly Ser Gly Trp Ala Asp
 260 265 270
 Glu Ser His Leu Thr Gly Glu Ser Asn Pro Glu Glu Lys Lys Ala Gly
 275 280 285
 Gly Lys Val Leu Ala Gly Ala Leu Met Thr Glu Gly Ser Val Val Tyr
 290 295 300
 Arg Ala Ala Gln Leu Gly Ser Gln Thr Leu Leu Gly Asp Met Met Asn
 305 310 315 320
 Ala Leu Ser Glu Ala Gln Gly Ser Lys Ala Pro Ile Ala Arg Val Ala
 325 330 335
 Asp Lys Ala Ala Ala Val Phe Val Pro Ala Val Val Gly Ile Ala Leu
 340 345 350
 Leu Thr Phe Ile Ala Thr Trp Leu Ile Lys Gly Asp Trp Thr Leu Ala
 355 360 365
 Leu Met His Ala Val Ala Val Leu Val Ile Ala Cys Pro Cys Ala Leu
 370 375 380
 Gly Leu Ala Thr Pro Ala Ala Ile Met Val Gly Met Gly Lys Ala Val
 385 390 395 400
 Lys His Gly Ile Trp Phe Lys Asp Ala Ala Ala Met Glu Glu Ala Ala
 405 410 415
 His Val Asp Ala Val Val Leu Asp Lys Thr Gly Thr Leu Thr Glu Gly
 420 425 430
 Lys Pro Gln Val Ala Ala Val Tyr Cys Val Pro Asp Ser Gly Phe Asp
 435 440 445
 Glu Asp Ala Leu Tyr Arg Ile Ala Ala Ala Val Glu Gln Asn Ala Ala
 450 455 460
 His Pro Leu Ala Arg Ala Ile Val Ser Ala Ala Gln Ala Arg Gly Leu
 465 470 475 480
 Glu Ile Pro Thr Ala Gln Asn Ala Gln Thr Ile Val Gly Ala Gly Ile
 485 490 495
 Thr Ala Glu Val Lys Gly Ala Gly Leu Val Lys Ala Gly Lys Ala Glu
 500 505 510
 Phe Ala Glu Leu Thr Leu Pro Lys Phe Ser Asp Gly Val Trp Glu Ile

515 520 525
 Ala Ser Val Val Ala Val Ser Val Asn Gly Lys Pro Ile Gly Ala Phe
 530 535 540
 Ala Leu Ala Asp Ala Leu Lys Ala Asp Thr Ala Glu Ala Ile Gly Arg
 545 550 555 560
 Leu Lys Lys His Asn Ile Asp Val Tyr Ile Met Ser Gly Asp Asn Gln
 565 570 575
 Gly Thr Val Glu Tyr Val Ala Lys Gln Leu Gly Ile Ala His Ala Phe
 580 585 590
 Gly Asn Met Ser Pro Arg Asp Lys Ala Ala Glu Val Gln Lys Leu Lys
 595 600 605
 Ala Ala Gly Lys Thr Val Ala Met Val Gly Asp Gly Ile Asn Asp Ala
 610 615 620
 Pro Ala Leu Ala Ala Ala Asn Val Ser Phe Ala Met Lys Gly Gly Ala
 625 630 635 640
 Asp Val Ala Glu His Thr Ala Ser Ala Thr Leu Met Gln His Ser Val
 645 650 655
 Asn Gln Leu Ala Asp Ala Leu Ser Val Ser Arg Ala Thr Leu Lys Asn
 660 665 670
 Ile Lys Gln Asn Leu Phe Phe Ala Phe Phe Tyr Asn Ile Leu Gly Ile
 675 680 685
 Pro Leu Ala Ala Leu Gly Phe Leu Asn Pro Val Ile Ala Gly Ala Ala
 690 695 700
 Met Ala Ala Ser Ser Val Ser Val Leu Ser Asn Ala Leu Arg Leu Lys
 705 710 715 720
 Arg Val Lys Ile Asp
 725

<210> 1833
 <211> 1551
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1833
 Ala Thr Gly Ala Ala Ala Ala Ala Cys Cys Thr Thr Thr Gly Ala
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 20 25 30
 Ala Thr Thr Gly Cys Thr Cys Gly Gly Cys Gly Thr Thr Gly Cys Thr
 35 40 45

Thr Thr Gly Gly Gly Thr Ala Cys Ala Cys Cys Thr Thr Ala Thr Thr
 50 55 60

Ala Thr Thr Thr Gly Gly Gly Thr Gly Thr Cys Ala Ala Ala Gly Cys
 65 70 75 80

Ala Gly Ala Ala Gly Ala Ala Ala Gly Thr Cys Thr Gly Ala Cys Gly
 85 90 95

Cys Ala Gly Cys Ala Gly Cys Ala Ala Ala Ala Ala Ala Thr Ala Thr
 100 105 110

Thr Gly Cys Ala Gly Ala Ala Ala Cys Gly Gly Gly Cys Thr Thr
 115 120 125

Thr Thr Thr Gly Ala Cys Cys Gly Thr Cys Gly Ala Ala Thr Cys Gly
 130 135 140

Cys Ala Cys Cys Ala Gly Thr Ala Thr Gly Ala Thr Cys Gly Ala Gly
 145 150 155 160

Gly Cys Thr Gly Gly Thr Thr Thr Ala Cys Cys Thr Cys Thr Ala Cys
 165 170 175

Gly Gly Ala Ala Ala Cys Gly Ala Cys Gly Gly Thr Cys Ala Thr Cys
 180 185 190

Cys Gly Thr Cys Thr Gly Ala Ala Ala Cys Cys Cys Gly Ala Gly Thr
 195 200 205

Thr Gly Cys Thr Gly Cys Ala Thr Ala Ala Thr Gly Cys Gly Cys Ala
 210 215 220

Gly Ala Ala Ala Thr Ala Cys Cys Thr Gly Cys Cys Gly Gly Ala Thr
 225 230 235 240

Ala Ala Cys Thr Thr Gly Ala Ala Ala Ala Thr Ala Gly Thr Gly Thr
 245 250 255

Thr Gly Gly Ala Ala Cys Ala Gly Cys Cys Gly Gly Thr Thr Ala Cys
 260 265 270

Gly Cys Thr Gly Gly Thr Ala Ala Ala Cys Cys Ala Thr Ala Thr Cys
 275 280 285

Ala Cys Gly Cys Ala Cys Gly Gly Cys Cys Cys Thr Thr Thr Cys Gly
 290 295 300

Cys Cys Gly Gly Cys Gly Gly Ala Thr Thr Cys Gly Gly Cys Ala Cys
 305 310 315 320

Gly Cys Ala Gly Gly Cys Gly Cys Ala Cys Ala Thr Thr Gly Ala Ala
 325 330 335

Ala Cys Cys Gly Ala Gly Thr Thr Cys Ala Ala Ala Thr Ala Cys Gly
 340 345 350

Cys Gly Cys Cys Thr Gly Ala Ala Ala Cys Gly Gly Ala Ala Ala Ala
 355 360 365
 Ala Gly Thr Thr Thr Thr Gly Gly Ala Ala Cys Gly Cys Thr Thr Thr
 370 375 380
 Thr Thr Thr Gly Gly Gly Ala Ala Ala Cys Ala Ala Gly Thr Thr Cys
 385 390 395 400
 Cys Gly Gly Thr Thr Thr Cys Cys Cys Thr Thr Gly Cys Cys Ala Ala
 405 410 415
 Thr Ala Cys Cys Gly Thr Thr Thr Ala Thr Thr Thr Cys Ala Ala Cys
 420 425 430
 Gly Gly Cys Ala Gly Cys Gly Gly Thr Ala Ala Ala Ala Thr Gly Gly
 435 440 445
 Ala Ala Gly Thr Cys Ala Gly Thr Gly Thr Thr Cys Cys Cys Gly Cys
 450 455 460
 Thr Thr Thr Cys Gly Ala Thr Thr Ala Thr Gly Ala Ala Gly Ala Ala
 465 470 475 480
 Cys Thr Gly Thr Cys Gly Gly Gly Cys Ala Thr Cys Ala Gly Gly Cys
 485 490 495
 Thr Gly Cys Ala Cys Thr Gly Gly Gly Ala Ala Gly Gly Cys Cys Thr
 500 505 510
 Gly Ala Cys Gly Gly Gly Gly Gly Ala Ala Ala Cys Gly Gly Thr Thr
 515 520 525
 Thr Ala Thr Cys Ala Ala Ala Ala Ala Gly Gly Thr Thr Thr Cys Ala
 530 535 540
 Ala Ala Ala Gly Cys Thr Ala Cys Cys Gly Cys Ala Ala Cys Ala Gly
 545 550 555 560
 Cys Thr Ala Thr Gly Ala Thr Gly Cys Gly Cys Cys Cys Thr Thr Gly
 565 570 575
 Thr Thr Cys Ala Ala Ala Ala Thr Cys Ala Ala Gly Cys Thr Gly Gly
 580 585 590
 Cys Ala Gly Ala Cys Ala Ala Ala Gly Gly Cys Gly Ala Thr Gly Cys
 595 600 605
 Cys Gly Cys Gly Thr Thr Thr Gly Ala Ala Ala Ala Ala Gly Cys Gly
 610 615 620
 Cys Ala Thr Thr Thr Cys Gly Ala Thr Thr Cys Gly Gly Ala Ala Ala
 625 630 635 640
 Cys Thr Thr Cys Ala Gly Ala Cys Gly Gly Cys Ala Thr Cys Ala Ala
 645 650 655

Thr Cys Cys Gly Cys Thr Thr Gly Cys Thr Thr Thr Gly Gly Gly Cys
 660 665 670
 Ala Gly Cys Ala Gly Cys Ala Ala Thr Cys Thr Gly Ala Cys Thr Thr
 675 680 685
 Thr Gly Gly Ala Ala Ala Ala Ala Thr Thr Thr Thr Cys Gly Cys Thr
 690 695 700
 Cys Gly Ala Ala Thr Gly Gly Ala Ala Ala Gly Ala Gly Gly Gly Thr
 705 710 715 720
 Gly Thr Cys Gly Ala Thr Thr Ala Cys Ala Ala Cys Gly Thr Cys Ala
 725 730 735
 Ala Ala Thr Thr Gly Ala Ala Cys Gly Ala Ala Cys Thr Gly Gly Thr
 740 745 750
 Cys Ala Ala Cys Cys Thr Cys Gly Thr Thr Ala Cys Cys Gly Ala Thr
 755 760 765
 Thr Thr Gly Cys Ala Gly Ala Thr Cys Gly Gly Cys Gly Cys Gly Thr
 770 775 780
 Thr Thr Ala Thr Cys Ala Ala Thr Cys Cys Cys Ala Ala Cys Gly Gly
 785 790 795 800
 Cys Ala Gly Cys Ala Thr Cys Gly Cys Ala Cys Cys Thr Thr Cys Cys
 805 810 815
 Ala Ala Ala Ala Thr Cys Gly Ala Ala Gly Thr Cys Gly Gly Cys Ala
 820 825 830
 Ala Gly Cys Thr Gly Gly Cys Thr Thr Thr Thr Thr Cys Ala Ala Cys
 835 840 845
 Cys Ala Ala Gly Ala Cys Cys Gly Gly Gly Gly Ala Ala Thr Cys Gly
 850 855 860
 Gly Gly Cys Gly Cys Gly Thr Thr Thr Ala Thr Cys Gly Ala Cys Ala
 865 870 875 880
 Gly Cys Gly Ala Ala Gly Gly Gly Cys Gly Gly Thr Thr Cys Cys Gly
 885 890 895
 Thr Thr Thr Cys Gly Ala Thr Ala Cys Gly Thr Thr Gly Gly Thr Gly
 900 905 910
 Thr Ala Cys Gly Gly Cys Gly Ala Thr Gly Ala Ala Ala Ala Ala Thr
 915 920 925
 Ala Cys Gly Gly Cys Cys Cys Gly Cys Thr Gly Gly Ala Cys Ala Thr
 930 935 940
 Cys Cys Ala Thr Ala Thr Cys Gly Cys Thr Gly Cys Cys Gly Ala Ala
 945 950 955 960

Cys Ala Cys Cys Thr Cys Gly Ala Thr Gly Cys Thr Thr Cys Thr Gly
 965 970 975

Cys Cys Thr Thr Ala Ala Cys Cys Gly Thr Ala Thr Thr Gly Ala Ala
 980 985 990

Ala Cys Gly Cys Ala Ala Gly Thr Thr Thr Gly Cys Ala Cys Ala Ala
 995 1000 1005

Ala Thr Thr Thr Cys Thr Gly Cys Cys Ala Ala Ala Ala Ala Ala Ala
 1010 1015 1020

Thr Gly Ala Cys Thr Gly Ala Gly Gly Ala Ala Cys Ala Ala Ala Thr
 1025 1030 1035 1040

Cys Cys Gly Cys Ala Ala Thr Gly Ala Thr Thr Thr Gly Ala Thr Thr
 1045 1050 1055

Gly Cys Gly Gly Cys Ala Gly Thr Cys Ala Ala Ala Gly Gly Cys Gly
 1060 1065 1070

Ala Thr Gly Cys Thr Thr Cys Cys Gly Gly Ala Thr Thr Ala Thr Thr
 1075 1080 1085

Thr Ala Cys Cys Cys Ala Thr Gly Ala Cys Cys Cys Gly Gly Thr Ala
 1090 1095 1100

Cys Thr Ala Ala Ala Thr Ala Thr Cys Ala Ala Ala Thr Thr Thr
 1105 1110 1115 1120

Thr Cys Cys Gly Thr Thr Thr Cys Ala Cys Cys Cys Thr Gly Cys Cys
 1125 1130 1135

Thr Cys Ala Gly Gly Gly Ala Ala Ala Ala Ala Thr Thr Gly Ala Thr
 1140 1145 1150

Gly Thr Gly Gly Gly Cys Gly Gly Ala Ala Ala Ala Ala Thr Cys Ala
 1155 1160 1165

Thr Gly Thr Thr Thr Ala Ala Ala Gly Gly Cys Ala Thr Gly Ala Ala
 1170 1175 1180

Gly Ala Ala Gly Gly Ala Ala Gly Ala Thr Thr Thr Gly Ala Ala Cys
 1185 1190 1195 1200

Cys Ala Ala Thr Thr Gly Gly Gly Ala Cys Thr Gly Ala Thr Gly Thr
 1205 1210 1215

Thr Ala Ala Ala Gly Ala Ala Ala Ala Cys Cys Gly Ala Gly Gly Cys
 1220 1225 1230

Ala Ala Ala Cys Ala Thr Cys Ala Gly Ala Ala Thr Gly Ala Gly Thr
 1235 1240 1245

Ala Thr Thr Cys Cys Thr Cys Ala Ala Ala Ala Ala Thr Gly Thr
 1250 1255 1260

Thr Gly Gly Ala Ala Gly Ala Thr Thr Thr Gly Gly Cys Gly Gly Thr
1265 1270 1275 1280

Ala Ala Gly Thr Cys Ala Gly Gly Cys Thr Gly Gly Ala Ala Ala Thr
1285 1290 1295

Ala Thr Thr Thr Thr Cys Ala Gly Thr Gly Thr Ala Ala Ala Thr Gly
1300 1305 1310

Cys Cys Gly Ala Ala Gly Ala Thr Gly Ala Gly Gly Cys Gly Gly Ala
1315 1320 1325

Ala Gly Cys Cys Ala Gly Ala Gly Cys Ala Ala Gly Cys Ala Thr Thr
1330 1335 1340

Gly Cys Cys Gly Ala Thr Ala Thr Thr Ala Ala Thr Gly Ala Ala Ala
1345 1350 1355 1360

Cys Ala Thr Thr Gly Cys Gly Cys Cys Thr Gly Ala Thr Gly Gly Thr
1365 1370 1375

Gly Gly Ala Cys Ala Gly Thr Ala Cys Gly Gly Thr Cys Cys Ala Ala
1380 1385 1390

Ala Gly Thr Ala Thr Gly Gly Cys Ala Ala Gly Gly Gly Ala Ala Ala
1395 1400 1405

Ala Ala Thr Ala Thr Cys Thr Thr Ala Cys Thr Thr Thr Ala Gly Ala
1410 1415 1420

Cys Gly Gly Thr Ala Ala Thr Cys Ala Gly Ala Thr Thr Gly Ala Thr
1425 1430 1435 1440

Ala Cys Gly Gly Thr Cys Ala Thr Thr Thr Cys Cys Cys Thr Thr Ala
1445 1450 1455

Ala Ala Ala Ala Cys Ala Ala Cys Gly Cys Cys Cys Thr Gly Ala Ala
1460 1465 1470

Gly Thr Thr Ala Ala Ala Cys Gly Gly Gly Ala Ala Ala Ala Cys Gly
1475 1480 1485

Cys Thr Gly Cys Ala Ala Ala Ala Thr Gly Ala Ala Cys Cys Cys Gly
1490 1495 1500

Ala Thr Cys Cys Thr Gly Ala Thr Thr Thr Thr Gly Ala Cys Gly Ala
1505 1510 1515 1520

Gly Gly Gly Ala Gly Ala Thr Ala Thr Gly Gly Thr Thr Thr Cys Cys
1525 1530 1535

Gly Gly Cys Cys Ala Gly Cys Cys Gly Cys Ala Thr Thr Ala Ala
1540 1545 1550

<210> 1834

<211> 516

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1834

Met Lys Lys Pro Leu Ile Ser Val Ala Ala Val Leu Leu Gly Val Ala
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20 25 30
Gln Gln Gln Lys Ile Leu Gln Lys Thr Gly Phe Leu Thr Val Glu Ser
35 40 45
His Gln Tyr Asp Arg Gly Trp Phe Thr Ser Thr Glu Thr Thr Val Ile
50 55 60
Arg Leu Lys Pro Glu Leu Leu His Asn Ala Gln Lys Tyr Leu Pro Asp
65 70 75 80
Asn Leu Lys Ile Val Leu Glu Gln Pro Val Thr Leu Val Asn His Ile
85 90 95
Thr His Gly Pro Phe Ala Gly Gly Phe Gly Thr Gln Ala His Ile Glu
100 105 110
Thr Glu Phe Lys Tyr Ala Pro Glu Thr Glu Lys Val Leu Glu Arg Phe
115 120 125
Phe Gly Lys Gln Val Pro Val Ser Leu Ala Asn Thr Val Tyr Phe Asn
130 135 140
Gly Ser Gly Lys Met Glu Val Ser Val Pro Ala Phe Asp Tyr Glu Glu
145 150 155 160
Leu Ser Gly Ile Arg Leu His Trp Glu Gly Leu Thr Gly Glu Thr Val
165 170 175
Tyr Gln Lys Gly Phe Lys Ser Tyr Arg Asn Ser Tyr Asp Ala Pro Leu
180 185 190
Phe Lys Ile Lys Leu Ala Asp Lys Gly Asp Ala Ala Phe Glu Lys Ala
195 200 205
His Phe Asp Ser Glu Thr Ser Asp Gly Ile Asn Pro Leu Ala Leu Gly
210 215 220
Ser Ser Asn Leu Thr Leu Glu Lys Phe Ser Leu Glu Trp Lys Glu Gly
225 230 235 240
Val Asp Tyr Asn Val Lys Leu Asn Glu Leu Val Asn Leu Val Thr Asp
245 250 255
Leu Gln Ile Gly Ala Phe Ile Asn Pro Asn Gly Ser Ile Ala Pro Ser
260 265 270
Lys Ile Glu Val Gly Lys Leu Ala Phe Ser Thr Lys Thr Gly Glu Ser

| 275 | 280 | 285 |
|--|-----|-----|
| Gly Ala Phe Ile Asp Ser Glu Gly Arg Phe Arg Phe Asp Thr Leu Val 290 295 300 | | |
| Tyr Gly Asp Glu Lys Tyr Gly Pro Leu Asp Ile His Ile Ala Ala Glu 305 310 315 320 | | |
| His Leu Asp Ala Ser Ala Leu Thr Val Leu Lys Arg Lys Phe Ala Gln 325 330 335 | | |
| Ile Ser Ala Lys Lys Met Thr Glu Glu Gln Ile Arg Asn Asp Leu Ile 340 345 350 | | |
| Ala Ala Val Lys Gly Asp Ala Ser Gly Leu Phe Thr His Asp Pro Val 355 360 365 | | |
| Leu Asn Ile Lys Ile Phe Arg Phe Thr Leu Pro Gln Gly Lys Ile Asp 370 375 380 | | |
| Val Gly Gly Lys Ile Met Phe Lys Gly Met Lys Lys Glu Asp Leu Asn 385 390 395 400 | | |
| Gln Leu Gly Leu Met Leu Lys Lys Thr Glu Ala Asn Ile Arg Met Ser 405 410 415 | | |
| Ile Pro Gln Lys Met Leu Glu Asp Leu Ala Val Ser Gln Ala Gly Asn 420 425 430 | | |
| Ile Phe Ser Val Asn Ala Glu Asp Glu Ala Glu Ala Arg Ala Ser Ile 435 440 445 | | |
| Ala Asp Ile Asn Glu Thr Leu Arg Leu Met Val Asp Ser Thr Val Gln 450 455 460 | | |
| Ser Met Ala Arg Glu Lys Tyr Leu Thr Leu Asp Gly Asn Gln Ile Asp 465 470 475 480 | | |
| Thr Val Ile Ser Leu Lys Asn Asn Ala Leu Lys Leu Asn Gly Lys Thr 485 490 495 | | |
| Leu Gln Asn Glu Pro Asp Pro Asp Phe Asp Glu Gly Asp Met Val Ser 500 505 510 | | |
| Gly Gln Pro His 515 | | |

<210> 1835

<211> 1388

<212> DNA

<213> Neisseria meningitidis

<400> 1835

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cgaaaataacc tgccggataa cctgaaaaca gtgttggaac agccggttac gctggttaac 120
catatcacgc acggcccttt cgccggcgga ttcggcacgc aggcgtacat tgaaaccgag 180

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|------|
| ttcaaatacg | cgctgaaac | ggaaaaagtt | ctggaacgct | tttttgaaa | acaagtcccc | 240 |
| gcttcccttg | ccaataccgt | ttattttaac | ggcagcggta | aaatggaagt | cagtgttccc | 300 |
| gccttcgatt | atgaagagct | gtcgggcatac | agctgcactg | ggaakgcctg | acgggagaaa | 360 |
| cggtttatca | aaaaggtttc | aaaagctacc | ggaacggcta | tgatgcccc | ttgtttaaaa | 420 |
| tcaagctggc | agacaaaggc | gatgccgcgt | ttgaaaaagt | gcatttcgat | tcggaaactt | 480 |
| cagacggcat | caatccgctt | gctttgggca | gcagcaatct | gaccttgga | aaatttctcc | 540 |
| tagaatggaa | agagggtgtc | gattacaacg | tcaagttaaa | cgaactggtc | aatcttgta | 600 |
| ccgatttgca | gattggcgcg | tttatcaatc | ccaacggcag | catcgcacct | tccaaaatcg | 660 |
| aagtcggcaa | actggctttt | tcaaccaaga | ccggggaatc | aggcgcgttt | atcaacagt | 720 |
| aagggcagtt | ccgtttcgat | acactgggtg | acggcgatga | aaaatacggc | ccgctggaca | 780 |
| tccatatcgc | tgccgaacac | ctcgatgctt | ctgccttaac | cgtattgaaa | cgcaagtttg | 840 |
| cacaaatttc | cgccaaaaaa | atgaccgagg | aacaaatccg | caatgatttg | attgccgccc | 900 |
| tcaaaggaga | ggcttcgga | ctgttcacca | acaatcccgt | attggacatt | aaaactttcc | 960 |
| gattcacgct | gccatcgga | aaaatcgatg | tgggcggaaa | aatcatgttt | aaagacatga | 1020 |
| agaaggaaga | tttgaatcaa | ttgggtttga | tgctgaagaa | aaccgaagcc | gacatcagaa | 1080 |
| tgagtattcc | ccaaaaaatg | ctggaagact | tggcgtcag | tcaagcaggc | aatattttca | 1140 |
| gcgtcaatgc | cgaagatgag | gcggaaggca | gggcaagtct | tgacgacatc | aacgagacct | 1200 |
| tgcgctgat | ggtggacagt | acggttcaga | gtatggcaag | ggaaaaatat | ctgactttga | 1260 |
| acggcgacca | gattgatact | gccatttctc | tgaaaaacaa | tcagttgaaa | ttgaacggta | 1320 |
| aaacgttgca | aaacgaaccg | gagccggatt | ttgatgaagg | cggtatgggt | tcagagccgc | 1380 |
| agcagtaa | | | | | | 1388 |

<210> 1836

<211> 462

<212> PRT

<213> Neisseria meningitidis

<400> 1836

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Trp | Phe | Thr | Ser | Met | Glu | Thr | Thr | Val | Ile | Arg | Leu | Lys | Pro | Glu | Leu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Asn | Asn | Ala | Arg | Lys | Tyr | Leu | Pro | Asp | Asn | Leu | Lys | Thr | Val | Leu |
| | | | 20 | | | | | 25 | | | | | | 30 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Gln | Pro | Val | Thr | Leu | Val | Asn | His | Ile | Thr | His | Gly | Pro | Phe | Ala |
| | | 35 | | | | | | 40 | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Gly | Phe | Gly | Thr | Gln | Ala | Tyr | Ile | Glu | Thr | Glu | Phe | Lys | Tyr | Ala |
| | 50 | | | | | 55 | | | | | | 60 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Glu | Thr | Glu | Lys | Val | Leu | Glu | Arg | Phe | Phe | Gly | Lys | Gln | Val | Pro |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Ser | Leu | Ala | Asn | Thr | Val | Tyr | Phe | Asn | Gly | Ser | Gly | Lys | Met | Glu |
| | | | | 85 | | | | | 90 | | | | | 95 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Ser | Val | Pro | Ala | Phe | Asp | Tyr | Glu | Glu | Leu | Ser | Gly | Ile | Xaa | Leu |
| | | | 100 | | | | | 105 | | | | | | 110 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| His | Trp | Glu | Xaa | Leu | Thr | Gly | Glu | Thr | Val | Tyr | Gln | Lys | Gly | Phe | Lys |
| | | 115 | | | | | 120 | | | | | 125 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Tyr | Arg | Asn | Gly | Tyr | Asp | Ala | Pro | Leu | Phe | Lys | Ile | Lys | Leu | Ala |
| | | 130 | | | | 135 | | | | | | 140 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Lys | Gly | Asp | Ala | Ala | Phe | Glu | Lys | Val | His | Phe | Asp | Ser | Glu | Thr |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

| | | | |
|---|-----|-----|-----|
| 145 | 150 | 155 | 160 |
| Ser Asp Gly Ile Asn Pro Leu Ala Leu Gly Ser Ser Asn Leu Thr Leu | 165 | 170 | 175 |
| Glu Lys Phe Ser Leu Glu Trp Lys Glu Gly Val Asp Tyr Asn Val Lys | 180 | 185 | 190 |
| Leu Asn Glu Leu Val Asn Leu Val Thr Asp Leu Gln Ile Gly Ala Phe | 195 | 200 | 205 |
| Ile Asn Pro Asn Gly Ser Ile Ala Pro Ser Lys Ile Glu Val Gly Lys | 210 | 215 | 220 |
| Leu Ala Phe Ser Thr Lys Thr Gly Glu Ser Gly Ala Phe Ile Asn Ser | 225 | 230 | 235 |
| Glu Gly Gln Phe Arg Phe Asp Thr Leu Val Tyr Gly Asp Glu Lys Tyr | 245 | 250 | 255 |
| Gly Pro Leu Asp Ile His Ile Ala Ala Glu His Leu Asp Ala Ser Ala | 260 | 265 | 270 |
| Leu Thr Val Leu Lys Arg Lys Phe Ala Gln Ile Ser Ala Lys Lys Met | 275 | 280 | 285 |
| Thr Glu Glu Gln Ile Arg Asn Asp Leu Ile Ala Ala Val Lys Gly Glu | 290 | 295 | 300 |
| Ala Ser Gly Leu Phe Thr Asn Asn Pro Val Leu Asp Ile Lys Thr Phe | 305 | 310 | 315 |
| Arg Phe Thr Leu Pro Ser Gly Lys Ile Asp Val Gly Gly Lys Ile Met | 325 | 330 | 335 |
| Phe Lys Asp Met Lys Lys Glu Asp Leu Asn Gln Leu Gly Leu Met Leu | 340 | 345 | 350 |
| Lys Lys Thr Glu Ala Asp Ile Arg Met Ser Ile Pro Gln Lys Met Leu | 355 | 360 | 365 |
| Glu Asp Leu Ala Val Ser Gln Ala Gly Asn Ile Phe Ser Val Asn Ala | 370 | 375 | 380 |
| Glu Asp Glu Ala Glu Gly Arg Ala Ser Leu Asp Asp Ile Asn Glu Thr | 385 | 390 | 395 |
| Leu Arg Leu Met Val Asp Ser Thr Val Gln Ser Met Ala Arg Glu Lys | 405 | 410 | 415 |
| Tyr Leu Thr Leu Asn Gly Asp Gln Ile Asp Thr Ala Ile Ser Leu Lys | 420 | 425 | 430 |
| Asn Asn Gln Leu Lys Leu Asn Gly Lys Thr Leu Gln Asn Glu Pro Glu | 435 | 440 | 445 |
| Pro Asp Phe Asp Glu Gly Gly Met Val Ser Glu Pro Gln Gln | | | |

450

455

460

<210> 1837

<211> 1551

<212> DNA

<213> *Neisseria meningitidis*

<400> 1837

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gcgggcttct tgaccgtcga atcgcaccaa tatgagcgcg gctggtttac ctctacggaa 180
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tttgccggcg gattcggcac gcaggcgtac attgaaaccg agttcaaata cgcgcctgaa 360
acggaaaaag ttctggaacg cttttttgga aaacaagtcc cggtttcctt tgccaatacc 420
gtttatttta acggcagcgg taaaatggaa gtcagtgttc cgccttcga ttatgaagag 480
ctgtcgggca tcaggctgca ctgggaaggc ctgacgggag aaacggttta tcaaaaaggt 540
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gtcgattaca acgtcaagtt aaacgaactg gtcaatcttg ttaccgattt gcagattggc 780
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ggcacgctgg ttacggcgca tgaaaaatac ggccctcttg acatccatat cgctgccgaa 960
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ggattattta cccataaacc agtattggac attaaaactt tccgattcac gctgccatcg 1140
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atgctggaag acttgcggtt cagtcaagca ggcaatattt tcagcgtcaa tgccgaagat 1320

gaggcggaag gcagggcaag tcttgacgac atcaacgaga ccttgcgctt gatggtggac 1380
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atgccattt ctctgaaaaa caatcagttg aaattgaacg gtaaaacgtt gcaaaacgaa 1500
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```

<210> 1838

<211> 516

<212> PRT

<213> *Neisseria meningitidis*

<400> 1838 .

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Met Lys Lys Pro Leu Ile Ser Val Ala Ala Ala Leu Leu Gly Val Ala
  1             5             10             15

```

```

Leu Gly Thr Pro Tyr Tyr Leu Gly Val Lys Ala Glu Glu Ser Leu Thr
      20             25             30

```

```

Gln Gln Gln Lys Ile Leu Gln Glu Ala Gly Phe Leu Thr Val Glu Ser
      35             40             45

```

```

His Gln Tyr Glu Arg Gly Trp Phe Thr Ser Thr Glu Thr Thr Val Ile
      50             55             60

```

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Arg | Leu | Lys | Pro | Glu | Leu | Leu | His | Asn | Ala | Gln | Lys | Tyr | Leu | Pro | Asp | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | |
| Asn | Leu | Lys | Thr | Val | Leu | Glu | Gln | Pro | Val | Thr | Leu | Val | Asn | His | Ile | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |
| Thr | His | Gly | Pro | Phe | Ala | Gly | Gly | Phe | Gly | Thr | Gln | Ala | Tyr | Ile | Glu | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| Thr | Glu | Phe | Lys | Tyr | Ala | Pro | Glu | Thr | Glu | Lys | Val | Leu | Glu | Arg | Phe | |
| | | 115 | | | | | 120 | | | | | 125 | | | | |
| Phe | Gly | Lys | Gln | Val | Pro | Val | Ser | Leu | Ala | Asn | Thr | Val | Tyr | Phe | Asn | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| Gly | Ser | Gly | Lys | Met | Glu | Val | Ser | Val | Pro | Ala | Phe | Asp | Tyr | Glu | Glu | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | |
| Leu | Ser | Gly | Ile | Arg | Leu | His | Trp | Glu | Gly | Leu | Thr | Gly | Glu | Thr | Val | |
| | | | 165 | | | | | | 170 | | | | | 175 | | |
| Tyr | Gln | Lys | Gly | Phe | Lys | Ser | Tyr | Arg | Asn | Gly | Tyr | Asp | Ala | Pro | Leu | |
| | | 180 | | | | | | 185 | | | | | 190 | | | |
| Phe | Lys | Ile | Lys | Leu | Ala | Asp | Lys | Gly | Asp | Ala | Ala | Phe | Glu | Lys | Val | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| His | Phe | Asp | Ser | Glu | Thr | Ser | Asp | Gly | Ile | Asn | Pro | Leu | Ala | Leu | Gly | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| Ser | Ser | Asn | Leu | Thr | Leu | Glu | Lys | Phe | Ser | Leu | Glu | Trp | Lys | Glu | Gly | |
| 225 | | | | 230 | | | | | | 235 | | | | | 240 | |
| Val | Asp | Tyr | Asn | Val | Lys | Leu | Asn | Glu | Leu | Val | Asn | Leu | Val | Thr | Asp | |
| | | | 245 | | | | | | 250 | | | | | 255 | | |
| Leu | Gln | Ile | Gly | Ala | Phe | Ile | Asn | Pro | Asn | Gly | Ser | Ile | Ala | Pro | Ser | |
| | | 260 | | | | | | 265 | | | | | 270 | | | |
| Lys | Ile | Glu | Val | Gly | Lys | Leu | Ala | Phe | Ser | Thr | Lys | Thr | Gly | Glu | Ser | |
| | 275 | | | | | | 280 | | | | | 285 | | | | |
| Gly | Ala | Phe | Ile | Asp | Ser | Glu | Gly | Gln | Phe | Arg | Phe | Gly | Thr | Leu | Val | |
| | 290 | | | | | 295 | | | | | 300 | | | | | |
| Tyr | Gly | Asp | Glu | Lys | Tyr | Gly | Pro | Leu | Asp | Ile | His | Ile | Ala | Ala | Glu | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | |
| His | Leu | Asp | Ala | Ser | Ala | Leu | Thr | Val | Leu | Lys | Arg | Lys | Phe | Ala | Arg | |
| | | | 325 | | | | | | 330 | | | | | 335 | | |
| Ile | Ser | Ala | Lys | Lys | Met | Thr | Glu | Glu | Gln | Ile | Arg | Asn | Asp | Leu | Ile | |
| | | 340 | | | | | | 345 | | | | | 350 | | | |
| Ala | Ala | Val | Lys | Gly | Glu | Ala | Ser | Gly | Leu | Phe | Thr | His | Asn | Pro | Val | |
| | | 355 | | | | | 360 | | | | | 365 | | | | |

Leu Asp Ile Lys Thr Phe Arg Phe Thr Leu Pro Ser Gly Lys Ile Asp
 370 375 380
 Val Gly Gly Lys Ile Met Phe Lys Asp Met Lys Lys Glu Asp Leu Asn
 385 390 395 400
 Gln Leu Gly Leu Met Leu Lys Lys Thr Glu Ala Asp Ile Arg Met Ser
 405 410 415
 Ile Pro Gln Lys Met Leu Glu Asp Leu Ala Val Ser Gln Ala Gly Asn
 420 425 430
 Ile Phe Ser Val Asn Ala Glu Asp Glu Ala Glu Gly Arg Ala Ser Leu
 435 440 445
 Asp Asp Ile Asn Glu Thr Leu Arg Leu Met Val Asp Ser Thr Val Gln
 450 455 460
 Ser Met Ala Arg Glu Lys Tyr Leu Thr Leu Asn Gly Asp Gln Ile Asp
 465 470 475 480
 Thr Ala Ile Ser Leu Lys Asn Asn Gln Leu Lys Leu Asn Gly Lys Thr
 485 490 495
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 Glu Pro Gln Gln
 515

<210> 1839
 <211> 1551
 <212> DNA
 <213> Neisseria meningitidis

<400> 1839
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 acgggcttct tgaccgtcga atcgcaccaa tatgagcgcg gctgggttac ctctatggaa 180
 acgacggtca tccgtctgaa acccgagttg ctgaataatg cccgaaaata cctgccggat 240
 aacctgaaaa cagtgttgga acagccggtt acgctggtta accatatcac gcacggccct 300
 ttcgccggcg gattcggcac gcaggcgtag attgaaacog agttcaaata cgcgcctgaa 360
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 gtttatttta acggcagcgg taaaatggaa gtcagtgttc ccgccttcga ttatgaagag 480
 ctgtcgggca tcaggctgca ctgggaaggc ctgacgggag aaacgggtta tcaaaaaggt 540
 ttcaaaagct accggaacgg ctatgatgcc cccttgttta aaatcaagct ggcagacaaa 600
 ggcgatgccg cgtttgaaaa agtgcatttc gattcggaaa cttcagacgg catcaatccg 660
 cttgctttgg gcagcagcaa tctgaccttg gaaaaattct ccctagaatg gaaagagggt 720
 gtcgattaca acgtcaagtt aaacgaactg gtcaatcttg ttaccgattt gcagattggc 780
 gcgtttatca atcccaacgg cagcatcgca ccttccaaaa tcgaagtcgg caaactggct 840
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 gatacactgg tgtacggcga tgaaaaatac ggcccgtggt acatccatat cgtgccgaa 960
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 aaaatgaccg atgaacaaat ccgcaatgat ttgattgccg ccgtcaaagg agaggcttcc 1080
 ggactgttca ccaacaatcc cgtattggac attaaaactt tccgattcac gctgccatcg 1140

```

ggaaaaatcg atgtgggCGG aaaaatcatg tttaaagaca tgaagaagga agatttgaat 1200
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actgccattt ctctgaaaaa caatcagttg aaattgaacg gtaaaacgtt gcaaaacgaa 1500
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<210> 1840

<211> 516

<212> PRT

<213> Neisseria meningitidis

<400> 1840

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Leu Gly Thr Pro Tyr Tyr Leu Gly Val Lys Ala Glu Glu Ser Leu Thr
      20              25              30

Gln Gln Gln Lys Ile Leu Gln Glu Thr Gly Phe Leu Thr Val Glu Ser
      35              40              45

His Gln Tyr Glu Arg Gly Trp Phe Thr Ser Met Glu Thr Thr Val Ile
      50              55              60

Arg Leu Lys Pro Glu Leu Leu Asn Asn Ala Arg Lys Tyr Leu Pro Asp
      65              70              75              80

Asn Leu Lys Thr Val Leu Glu Gln Pro Val Thr Leu Val Asn His Ile
      85              90              95

Thr His Gly Pro Phe Ala Gly Gly Phe Gly Thr Gln Ala Tyr Ile Glu
     100              105              110

Thr Glu Phe Lys Tyr Ala Pro Glu Thr Glu Lys Val Leu Glu Arg Phe
     115              120              125

Phe Gly Lys Gln Val Pro Ala Ser Leu Ala Asn Thr Val Tyr Phe Asn
     130              135              140

Gly Ser Gly Lys Met Glu Val Ser Val Pro Ala Phe Asp Tyr Glu Glu
     145              150              155              160

Leu Ser Gly Ile Arg Leu His Trp Glu Gly Leu Thr Gly Glu Thr Val
     165              170              175

Tyr Gln Lys Gly Phe Lys Ser Tyr Arg Asn Gly Tyr Asp Ala Pro Leu
     180              185              190

Phe Lys Ile Lys Leu Ala Asp Lys Gly Asp Ala Ala Phe Glu Lys Val
     195              200              205

His Phe Asp Ser Glu Thr Ser Asp Gly Ile Asn Pro Leu Ala Leu Gly
     210              215              220

```

Ser Ser Asn Leu Thr Leu Glu Lys Phe Ser Leu Glu Trp Lys Glu Gly
 225 230 235 240
 Val Asp Tyr Asn Val Lys Leu Asn Glu Leu Val Asn Leu Val Thr Asp
 245 250 255
 Leu Gln Ile Gly Ala Phe Ile Asn Pro Asn Gly Ser Ile Ala Pro Ser
 260 265 270
 Lys Ile Glu Val Gly Lys Leu Ala Phe Ser Thr Lys Thr Gly Glu Ser
 275 280 285
 Gly Ala Phe Ile Asn Ser Glu Gly Gln Phe Arg Phe Asp Thr Leu Val
 290 295 300
 Tyr Gly Asp Glu Lys Tyr Gly Pro Leu Asp Ile His Ile Ala Ala Glu
 305 310 315 320
 His Leu Asp Ala Ser Ala Leu Thr Val Leu Lys Arg Lys Phe Ala Gln
 325 330 335
 Ile Ser Ala Lys Lys Met Thr Glu Glu Gln Ile Arg Asn Asp Leu Ile
 340 345 350
 Ala Ala Val Lys Gly Glu Ala Ser Gly Leu Phe Thr Asn Asn Pro Val
 355 360 365
 Leu Asp Ile Lys Thr Phe Arg Phe Thr Leu Pro Ser Gly Lys Ile Asp
 370 375 380
 Val Gly Gly Lys Ile Met Phe Lys Asp Met Lys Lys Glu Asp Leu Asn
 385 390 395 400
 Gln Leu Gly Leu Met Leu Lys Lys Thr Glu Ala Asp Ile Arg Met Ser
 405 410 415
 Ile Pro Gln Lys Met Leu Glu Asp Leu Ala Val Ser Gln Ala Gly Asn
 420 425 430
 Ile Phe Ser Val Asn Ala Glu Asp Glu Ala Glu Gly Arg Ala Ser Leu
 435 440 445
 Asp Asp Ile Asn Glu Thr Leu Arg Leu Met Val Asp Ser Thr Val Gln
 450 455 460
 Ser Met Ala Arg Glu Lys Tyr Leu Thr Leu Asn Gly Asp Gln Ile Asp
 465 470 475 480
 Thr Ala Ile Ser Leu Lys Asn Asn Gln Leu Lys Leu Asn Gly Lys Thr
 485 490 495
 Leu Gln Asn Glu Pro Glu Pro Asp Phe Asp Glu Gly Gly Met Val Ser
 500 505 510
 Glu Pro Gln Gln
 515

<210> 1841
 <211> 1341
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1841
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<210> 1842
 <211> 446
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1842
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 20 25 30
 Val Val Arg Phe Ser Val Gly Phe Gly Lys Pro Phe Phe Thr Arg Lys
 35 40 45
 Arg Gly Asp Thr Glu Trp Cys Leu Ala Pro Ile Pro Leu Gly Gly Tyr
 50 55 60
 Val Lys Met Val Asp Thr Arg Glu Gly Glu Val Ser Glu Ala Asp Leu
 65 70 75 80
 Pro Tyr Ala Phe Asp Lys Gln His Pro Ala Lys Arg Ile Ala Ile Val
 85 90 95
 Ala Ala Gly Pro Leu Thr Asn Leu Ala Leu Ala Val Leu Leu Tyr Gly

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| 100 | | | | | | | 105 | | | | | 110 | | | | |
| Leu | Ser | Phe | Ser | Phe | Gly | Val | Thr | Glu | Leu | Arg | Pro | Tyr | Val | Gly | Thr | |
| | | 115 | | | | 120 | | | | | | 125 | | | | |
| Val | Glu | Pro | Asp | Thr | Val | Ala | Ala | Arg | Thr | Gly | Phe | Gln | Ser | Gly | Asp | |
| | | 130 | | | | 135 | | | | 140 | | | | | | |
| Lys | Ile | Gln | Ser | Val | Asn | Gly | Val | Ser | Val | Gln | Asp | Trp | Ser | Ser | Ala | |
| 145 | | | | 150 | | | | | | 155 | | | | 160 | | |
| Gln | Thr | Glu | Ile | Val | Leu | Asn | Leu | Glu | Ala | Gly | Lys | Val | Ala | Val | Gly | |
| | | | | 165 | | | | 170 | | | | | | 175 | | |
| Val | Gln | Thr | Ala | Ser | Gly | Ala | Gln | Thr | Val | Arg | Thr | Ile | Asp | Ala | Ala | |
| | | 180 | | | | | | 185 | | | | 190 | | | | |
| Gly | Thr | Pro | Glu | Ala | Gly | Lys | Ile | Ala | Lys | Asn | Gln | Gly | Tyr | Ile | Gly | |
| | | 195 | | | | 200 | | | | | | 205 | | | | |
| Leu | Met | Pro | Phe | Lys | Ile | Thr | Thr | Val | Ala | Gly | Gly | Val | Glu | Lys | Gly | |
| 210 | | | | | | 215 | | | | 220 | | | | | | |
| Ser | Pro | Ala | Glu | Lys | Ala | Gly | Leu | Lys | Pro | Gly | Asp | Arg | Leu | Thr | Ala | |
| 225 | | | | 230 | | | | | | 235 | | | | 240 | | |
| Ala | Asp | Gly | Lys | Pro | Ile | Ala | Ser | Trp | Gln | Glu | Trp | Ala | Asn | Leu | Thr | |
| | | | | 245 | | | | 250 | | | | | | 255 | | |
| Arg | Gln | Ser | Pro | Gly | Lys | Lys | Ile | Thr | Leu | Thr | Tyr | Glu | Arg | Ala | Gly | |
| | | 260 | | | | | | 265 | | | | 270 | | | | |
| Gln | Thr | His | Thr | Ala | Asp | Ile | Arg | Pro | Asp | Thr | Val | Glu | Gln | Pro | Asp | |
| | | 275 | | | | 280 | | | | | | 285 | | | | |
| His | Thr | Leu | Ile | Gly | Arg | Val | Gly | Leu | Arg | Pro | Gln | Pro | Asp | Arg | Ala | |
| 290 | | | | | | 295 | | | | 300 | | | | | | |
| Trp | Asp | Ala | Gln | Ile | Arg | Arg | Ser | Tyr | Arg | Pro | Ser | Val | Val | Arg | Ala | |
| 305 | | | | 310 | | | | | | 315 | | | | 320 | | |
| Phe | Gly | Met | Gly | Trp | Glu | Lys | Thr | Val | Ser | His | Ser | Trp | Thr | Thr | Leu | |
| | | | | 325 | | | | 330 | | | | | | 335 | | |
| Lys | Phe | Phe | Gly | Lys | Leu | Ile | Ser | Gly | Asn | Ala | Ser | Val | Ser | His | Ile | |
| | | 340 | | | | | | 345 | | | | 350 | | | | |
| Ser | Gly | Pro | Leu | Thr | Ile | Ala | Asp | Ile | Ala | Gly | Gln | Ser | Ala | Glu | Leu | |
| | | 355 | | | | 360 | | | | | | 365 | | | | |
| Gly | Leu | Gln | Ser | Tyr | Leu | Glu | Phe | Leu | Ala | Leu | Val | Ser | Ile | Ser | Leu | |
| 370 | | | | | | 375 | | | | 380 | | | | | | |
| Gly | Val | Leu | Asn | Leu | Leu | Pro | Val | Pro | Val | Leu | Asp | Gly | Gly | His | Leu | |
| 385 | | | | 390 | | | | | | 395 | | | | 400 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Phe | Tyr | Thr | Val | Glu | Trp | Ile | Arg | Gly | Lys | Pro | Leu | Gly | Glu | Arg |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| | | | | | | | | | | | | | | | |
| Val | Gln | Asn | Ile | Gly | Leu | Arg | Phe | Gly | Leu | Ala | Leu | Met | Met | Leu | Met |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| | | | | | | | | | | | | | | | |
| Met | Ala | Ala | Ala | Phe | Phe | Asn | Asp | Val | Thr | Arg | Leu | Ile | Gly | | |
| | | | 435 | | | | 440 | | | | | 445 | | | |

<210> 1843
 <211> 2682
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1843

| | | | | | | |
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| ttgcacaccc | ttctagcttt | tatcttcgcc | atcctgattt | tggtcagcct | gcacgagttc | 60 |
| ggacactaca | tcgttgccag | attgtgcggc | gtcaaagtcg | tacgcttttc | cgtcggcttc | 120 |
| ggcaaaccgt | ttttcacccg | aaagcgcggc | gacaccgaat | ggtgcctcgc | cccgattccg | 180 |
| ttgggcggtt | acgtcaaaat | ggtcgatacg | cgcgaaggcg | aagtatcaga | agccgattta | 240 |
| ccctacgctt | ttgacaaaca | acaccccgcc | aagcgcacgc | ccatcgtcgc | cgccggccca | 300 |
| ctgaccaacc | tcgcaactgg | ggttttgctg | tacggactga | gcttttcctt | cggcgtaacc | 360 |
| gaactgcgcc | cctacgtcgg | cacagtcgaa | cccgcaccca | ttgccgcccg | cgccggcttc | 420 |
| caaagcggcg | acaaaatata | atccgtcaac | ggcacacccg | ttgcagattg | gggcagcgcg | 480 |
| caaaccgaaa | tcgtcctcaa | cctcgaagcc | ggcaaagtcg | ccgtcggcgt | tcagacggca | 540 |
| tcgggcgcgc | aaaccgtccg | caccatcgat | gccgcaggca | cgccggaagc | cggtaaaatc | 600 |
| gcaaaaaacc | aaggctacat | cggactgatg | ccctttaaaa | tcacaaccgt | tgccggcggc | 660 |
| gtggaaaaag | gcagccccgc | cgaaaaagca | ggcctgaaac | cgggcgacag | gctgactgcc | 720 |
| gccgacggca | aacccatcgc | ctcatggcaa | gaatgggcaa | acctgaccgc | ccaaagcccc | 780 |
| ggcaaaaaaa | tcaccctgaa | ctacgaacgc | gccggacaaa | cccataccgc | cgacatccgc | 840 |
| cccgatactg | tcgaacagtc | cgaccacacc | ctgatcgggc | gcgtcggcct | ccgtccgcag | 900 |
| ccggacaggg | cgtggggacgc | gcaaatccgc | cgcagctacc | gtccgtctgt | tgtccgcgca | 960 |
| ttcggcatgg | gctgggaaaa | aaccgtttcc | cactcgtgga | caaccctcaa | atttttcggc | 1020 |
| aaactaatca | gcggcaacgc | ctccgtcagc | catatttccg | ggccgctgac | cattgccgac | 1080 |
| attgccggac | agtcgcgcga | actcggcttg | caaagttatt | tggatTTTT | agcactggtc | 1140 |
| agcatcagcc | tcggcgtgct | gaacctactg | cccgtccctg | ttttggacgg | cgggcacctc | 1200 |
| gtgttttata | ctgccgaatg | gatacgcggc | aaacctttgg | gcgaacgcgt | ccaaaacatc | 1260 |
| ggttttgcgt | tcgggctcgc | cctcatgatg | ctgatgatgg | cggtcgcctt | cttcaacgac | 1320 |
| gttaccgcgc | tgctcgggta | gttgcacacc | cttctagctt | ttatcttcgc | catcctgatt | 1380 |
| ttggtcagcc | tgcaacgagtt | cggacactac | atcgttgcca | gattgtgcgg | cgtcaaagtc | 1440 |
| gtacgctttt | ccgtcggctt | cggcaaacgc | tttttcaccc | gaaagcgcgg | cgacaccgaa | 1500 |
| tggtgcctcg | ccccgattcc | gttgggcggg | tacgtcaaaa | tggtcgatac | gcgcgaaggc | 1560 |
| gaagtatcag | aagccgattt | accctacgct | tttgacaaac | aacaccccg | caagcgcac | 1620 |
| gccatcgtcg | ccgcggcccc | actgaccaac | ctcgcactgg | cggttttgct | gtacggactg | 1680 |
| agcttttctt | tcggcgtaac | cgaactgcgc | ccctacgtcg | gcacagtcga | acccgacacc | 1740 |
| attgccgccc | gcgcgggctt | ccaaagcggc | gacaaaatac | aatccgtcaa | cggcacaccc | 1800 |
| gttgacagatt | ggggcagcgc | gcaaaccgaa | atcgtcctca | acctcgaagc | cggcaaagtc | 1860 |
| gccgtcggcg | ttcagacggc | atcgggcgcg | caaaccgtcc | gcaccatcga | tgccgcaggc | 1920 |
| acgccggaag | ccggtaaaat | cgcaaaaaac | caaggctaca | tcggactgat | gcccttttaa | 1980 |
| atcacaaccc | ttgccggcgg | cgtggaaaaa | ggcagccccg | ccgaaaaagc | aggcctgaaa | 2040 |
| ccgggcgcga | ggctgactgc | cgccgacggc | aaacccatcg | cctcatggca | agaatgggca | 2100 |
| aacctgaccc | gccaaagccc | cggcaaaaaa | atcaccttga | actacgaacg | cgccggacaa | 2160 |
| accataccg | ccgacatccg | ccccgatact | gtcgaacagt | ccgaccacac | cctgatcggg | 2220 |
| cgcgtcggcc | tccgtccgca | gccggacagg | gcgtgggacg | cgcaaatccg | ccgcagctac | 2280 |
| cgtccgtctg | ttgtccgcgc | attcggcatg | ggctgggaaa | aaaccgtttc | ccactcgtgg | 2340 |
| acaacctca | aatttttcgg | caaactaatc | agcggcaacg | cctccgtcag | ccatatttcc | 2400 |
| gggccgtga | ccattgccga | cattgccgga | cagtccgccc | aactcggctt | gcaaagttat | 2460 |

```

ttggaatttt tagcactggt cagcatcagc ctcggcgtgc tgaacctact gcccgtcct 2520
gttttggacg gcgggcacct cgtgttttat actgccgaat ggatacgcgg caaacctttg 2580
ggcgaacgcg tccaaaacat cggtttgcgc ttctgggctcg ccctcatgat gctgatgatg 2640
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```

<210> 1844

<211> 446

<212> PRT

<213> Neisseria meningitidis

<400> 1844

```

Leu His Thr Leu Leu Ala Phe Ile Phe Ala Ile Leu Ile Leu Val Ser
  1             5             10             15

```

```

Leu His Glu Phe Gly His Tyr Ile Val Ala Arg Leu Cys Gly Val Lys
          20             25             30

```

```

Val Val Arg Phe Ser Val Gly Phe Gly Lys Pro Phe Phe Thr Arg Lys
          35             40             45

```

```

Arg Gly Asp Thr Glu Trp Cys Leu Ala Pro Ile Pro Leu Gly Gly Tyr
          50             55             60

```

```

Val Lys Met Val Asp Thr Arg Glu Gly Glu Val Ser Glu Ala Asp Leu
          65             70             75             80

```

```

Pro Tyr Ala Phe Asp Lys Gln His Pro Ala Lys Arg Ile Ala Ile Val
          85             90             95

```

```

Ala Ala Gly Pro Leu Thr Asn Leu Ala Leu Ala Val Leu Leu Tyr Gly
          100            105            110

```

```

Leu Ser Phe Ser Phe Gly Val Thr Glu Leu Arg Pro Tyr Val Gly Thr
          115            120            125

```

```

Val Glu Pro Asp Thr Ile Ala Ala Arg Ala Gly Phe Gln Ser Gly Asp
          130            135            140

```

```

Lys Ile Gln Ser Val Asn Gly Thr Pro Val Ala Asp Trp Gly Ser Ala
          145            150            155            160

```

```

Gln Thr Glu Ile Val Leu Asn Leu Glu Ala Gly Lys Val Ala Val Gly
          165            170            175

```

```

Val Gln Thr Ala Ser Gly Ala Gln Thr Val Arg Thr Ile Asp Ala Ala
          180            185            190

```

```

Gly Thr Pro Glu Ala Gly Lys Ile Ala Lys Asn Gln Gly Tyr Ile Gly
          195            200            205

```

```

Leu Met Pro Phe Lys Ile Thr Thr Val Ala Gly Gly Val Glu Lys Gly
          210            215            220

```

```

Ser Pro Ala Glu Lys Ala Gly Leu Lys Pro Gly Asp Arg Leu Thr Ala
          225            230            235            240

```

Ala Asp Gly Lys Pro Ile Ala Ser Trp Gln Glu Trp Ala Asn Leu Thr
245 250 255

Arg Gln Ser Pro Gly Lys Lys Ile Thr Leu Asn Tyr Glu Arg Ala Gly
260 265 270

Gln Thr His Thr Ala Asp Ile Arg Pro Asp Thr Val Glu Gln Ser Asp
275 280 285

His Thr Leu Ile Gly Arg Val Gly Leu Arg Pro Gln Pro Asp Arg Ala
290 295 300

Trp Asp Ala Gln Ile Arg Arg Ser Tyr Arg Pro Ser Val Val Arg Ala
305 310 315 320

Phe Gly Met Gly Trp Glu Lys Thr Val Ser His Ser Trp Thr Thr Leu
325 330 335

Lys Phe Phe Gly Lys Leu Ile Ser Gly Asn Ala Ser Val Ser His Ile
340 345 350

Ser Gly Pro Leu Thr Ile Ala Asp Ile Ala Gly Gln Ser Ala Glu Leu
355 360 365

Gly Leu Gln Ser Tyr Leu Glu Phe Leu Ala Leu Val Ser Ile Ser Leu
370 375 380

Gly Val Leu Asn Leu Leu Pro Val Pro Val Leu Asp Gly Gly His Leu
385 390 395 400

Val Phe Tyr Thr Ala Glu Trp Ile Arg Gly Lys Pro Leu Gly Glu Arg
405 410 415

Val Gln Asn Ile Gly Leu Arg Phe Gly Leu Ala Leu Met Met Leu Met
420 425 430

Met Ala Val Ala Phe Phe Asn Asp Val Thr Arg Leu Leu Gly
435 440 445

<210> 1845

<211> 1341

<212> DNA

<213> Neisseria meningitidis

<400> 1845

ttgcacacc ttctagcttt tatcttcgcc atcctgattt tggtcagcct gcacgaattc 60
ggacactaca tcgtcgccag attgtcgggc gtcaagggtg tgcgtttttc cgtcggcttc 120
ggcaaaccgt ttttcacccg aaagcgggc gacaccgaat ggtgcctcgc cccgattccg 180
ttgggcggtt acgtcaaaat ggtcgacacg cgcgaaggcg aagtatcaga agccgattta 240
ccctacgctt ttgacaaaca acaccccgcc aagcgcatcg ccatcgctcg cgccggcccc 300
ctgaccaacc tcgcactggc ggttttgctg tacggactga gcttttcctt cggcgttacc 360
gaactgcgcc cctatgtcgg cacagtcgaa cccgacacca ttgccgccc cgccggcttc 420
caaagcgggc acaaaataca atccgtcaac ggcacaccgc ttgcagattg gggcagcgcg 480
caaaccgaaa tcgtcctcaa cctcgaagcc ggcaaagtcg ccgtcggcgt tcagacggca 540
tcgggcgcgc aaaccgtccg caccatcgat gccgcaggca cgccggaagc cggtaaaatc 600

```

gcaaaaaaac aaggctacat cggactgatg ccctttaaaa tcacaaccgt tgccggcggc 660
gtggaaaaag gcagccccgc cgaaaaagca ggctgaaac cgggcgacag gctgactgcc 720
gccgacggca aacccatcgc ctcatggcaa gaatgggcaa acctgaccg ccaaagcccc 780
ggcaaaaaaa tcaccctgac ctacgaacgc gccggacaaa ccataccgc cgacatccgc 840
cccgatactg tcgaacagcc cgaccacacc ctgatcgggc gcgtcggcct ccgtccgcag 900
ccggacaggg cgtgggacgc gcaaattccg cgagctacc gtccgtctgt tgtccgcgca 960
ttcggcattg gctgggaaaa aaccgtttcc cactcggtga caaccctcaa attttcggc 1020
aaactaatca gcggcaacgc ctccgtcagc catatttccg gtccgctgac cattgccgat 1080
attgccggac agtccgccga actcggcttg caaagttatt tggaattttt ggcaactgtc 1140
agcatcagcc tcggcgtgct gaacctgctg cccgtccccg ttttgacgg cggccacctc 1200
gtgttttata ctgccgaatg gatacgggc aaacctttgg gcgaacgcgt ccaaaacatc 1260
ggtttgcgct tcgggcttgc cctcatgatg ctgatgatgg cggtcgcctt cttcaacgac 1320
gttaccgggc tgctcggtta g                                     1341

```

<210> 1846

<211> 446

<212> PRT

<213> Neisseria meningitidis

<400> 1846

```

Leu His Thr Leu Leu Ala Phe Ile Phe Ala Ile Leu Ile Leu Val Ser
  1             5             10             15

```

```

Leu His Glu Phe Gly His Tyr Ile Val Ala Arg Leu Cys Gly Val Lys
          20             25             30

```

```

Val Val Arg Phe Ser Val Gly Phe Gly Lys Pro Phe Phe Thr Arg Lys
          35             40             45

```

```

Arg Gly Asp Thr Glu Trp Cys Leu Ala Pro Ile Pro Leu Gly Gly Tyr
          50             55             60

```

```

Val Lys Met Val Asp Thr Arg Glu Gly Glu Val Ser Glu Ala Asp Leu
          65             70             75             80

```

```

Pro Tyr Ala Phe Asp Lys Gln His Pro Ala Lys Arg Ile Ala Ile Val
          85             90             95

```

```

Ala Ala Gly Pro Leu Thr Asn Leu Ala Leu Ala Val Leu Leu Tyr Gly
          100            105            110

```

```

Leu Ser Phe Ser Phe Gly Val Thr Glu Leu Arg Pro Tyr Val Gly Thr
          115            120            125

```

```

Val Glu Pro Asp Thr Ile Ala Ala Arg Ala Gly Phe Gln Ser Gly Asp
          130            135            140

```

```

Lys Ile Gln Ser Val Asn Gly Thr Pro Val Ala Asp Trp Gly Ser Ala
          145            150            155            160

```

```

Gln Thr Glu Ile Val Leu Asn Leu Glu Ala Gly Lys Val Ala Val Gly
          165            170            175

```

```

Val Gln Thr Ala Ser Gly Ala Gln Thr Val Arg Thr Ile Asp Ala Ala
          180            185            190

```

Gly Thr Pro Glu Ala Gly Lys Ile Ala Lys Asn Gln Gly Tyr Ile Gly
 195 200 205
 Leu Met Pro Phe Lys Ile Thr Thr Val Ala Gly Gly Val Glu Lys Gly
 210 215 220
 Ser Pro Ala Glu Lys Ala Gly Leu Lys Pro Gly Asp Arg Leu Thr Ala
 225 230 235 240
 Ala Asp Gly Lys Pro Ile Ala Ser Trp Gln Glu Trp Ala Asn Leu Thr
 245 250 255
 Arg Gln Ser Pro Gly Lys Lys Ile Thr Leu Thr Tyr Glu Arg Ala Gly
 260 265 270
 Gln Thr His Thr Ala Asp Ile Arg Pro Asp Thr Val Glu Gln Pro Asp
 275 280 285
 His Thr Leu Ile Gly Arg Val Gly Leu Arg Pro Gln Pro Asp Arg Ala
 290 295 300
 Trp Asp Ala Gln Ile Arg Arg Ser Tyr Arg Pro Ser Val Val Arg Ala
 305 310 315 320
 Phe Gly Met Gly Trp Glu Lys Thr Val Ser His Ser Trp Thr Thr Leu
 325 330 335
 Lys Phe Phe Gly Lys Leu Ile Ser Gly Asn Ala Ser Val Ser His Ile
 340 345 350
 Ser Gly Pro Leu Thr Ile Ala Asp Ile Ala Gly Gln Ser Ala Glu Leu
 355 360 365
 Gly Leu Gln Ser Tyr Leu Glu Phe Leu Ala Leu Val Ser Ile Ser Leu
 370 375 380
 Gly Val Leu Asn Leu Leu Pro Val Pro Val Leu Asp Gly Gly His Leu
 385 390 395 400
 Val Phe Tyr Thr Ala Glu Trp Ile Arg Gly Lys Pro Leu Gly Glu Arg
 405 410 415
 Val Gln Asn Ile Gly Leu Arg Phe Gly Leu Ala Leu Met Met Leu Met
 420 425 430
 Met Ala Val Ala Phe Phe Asn Asp Val Thr Arg Leu Leu Gly
 435 440 445

<210> 1847

<211> 714

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1847

atgattccgg acgtgttcgg tcagattttt tcgggcgcgt tcaaattcga cgcggcagca 60
 ggcggcttac tcggcgtct gatttcgcaa acgatgatga tgggcatcaa acgcggcctg 120

```

tattccaacg aggcgggtat gggttccgcg ccgaacgccg ccgcccgcgc cgaagtgaaa 180
caccctgttt cgcaagggtat gattcaaagt ctgggcgtgt ttgtcgatac catcatcggt 240
tggtcttgca cgccttcat catcttgatt taccaacagc cttatggcga tttgagcgg 300
gcggcgctga cgcaggcggc gattgtcagc caagtggggc aatggggcgc gggtttctc 360
gccgtcatcc tgtttatgtt tgccttttcc accgttatcg gcaactatgc ctatgccgag 420
tccaacgtcc aattcatcaa aagccattgg ctgattaccg ccgttttccg tatgctggtt 480
ttggcgtggg tctatttcgg cgcggttgcc aatgtgcctt tggctcggga tatggcggat 540
atggcgatgg gcatcatggc gtggatcaac ctgcgcgcca tcctgctgct ctgccattg 600
gcgtttatgc tgctgcgcga ttacaccgcc aagctgaaaa tgggcaaaga ccccgagttc 660
aaactttccg aacatccggg cctgaaacgc cgcatacaat ccgatgtttg gtaa 714

```

<210> 1848

<211> 237

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1848

```

Met Ile Pro Asp Val Phe Gly Gln Ile Phe Ser Gly Ala Phe Lys Phe
  1             5             10             15

```

```

Asp Ala Ala Ala Gly Gly Leu Leu Gly Gly Leu Ile Ser Gln Thr Met
      20             25             30

```

```

Met Met Gly Ile Lys Arg Gly Leu Tyr Ser Asn Glu Ala Gly Met Gly
      35             40             45

```

```

Ser Ala Pro Asn Ala Ala Ala Ala Glu Val Lys His Pro Val Ser
      50             55             60

```

```

Gln Gly Met Ile Gln Met Leu Gly Val Phe Val Asp Thr Ile Ile Val
      65             70             75             80

```

```

Cys Ser Cys Thr Ala Phe Ile Ile Leu Ile Tyr Gln Gln Pro Tyr Gly
      85             90             95

```

```

Asp Leu Ser Gly Ala Ala Leu Thr Gln Ala Ala Ile Val Ser Gln Val
      100            105            110

```

```

Gly Gln Trp Gly Ala Gly Phe Leu Ala Val Ile Leu Phe Met Phe Ala
      115            120            125

```

```

Phe Ser Thr Val Ile Gly Asn Tyr Ala Tyr Ala Glu Ser Asn Val Gln
      130            135            140

```

```

Phe Ile Lys Ser His Trp Leu Ile Thr Ala Val Phe Arg Met Leu Val
      145            150            155            160

```

```

Leu Ala Trp Val Tyr Phe Gly Ala Val Ala Asn Val Pro Leu Val Trp
      165            170            175

```

```

Asp Met Ala Asp Met Ala Met Gly Ile Met Ala Trp Ile Asn Leu Val
      180            185            190

```

```

Ala Ile Leu Leu Leu Ser Pro Leu Ala Phe Met Leu Leu Arg Asp Tyr
      195            200            205

```

Thr Ala Lys Leu Lys Met Gly Lys Asp Pro Glu Phe Lys Leu Ser Glu
 210 215 220

His Pro Gly Leu Lys Arg Arg Ile Lys Ser Asp Val Trp
 225 230 235

<210> 1849
 <211> 714
 <212> DNA
 <213> Neisseria meningitidis

<400> 1849
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 ggcggcttac tcggcgggtct gatttcgcaa acgatgatga tgggcatcaa acgcggcctg 120
 tattccaacg aggcgggtat gggttccgcg ccgaacgccg ccgccgccgc cgaagtga aa 180
 caccctgttt cgcaaggatg gattcaaatg ctgggcgtgt ttgtcgatac catcatcggt 240
 tgttcttgca ccgccttcat catcttgatt taccaacagc cttacggcga tttgagcggg 300
 gcggcgctga cgcaggcggc gattgtcagc caagtggggc aatggggcgc gggcttcctc 360
 gccgtcatcc tgtttatgtt tgccttttcc accgttatcg gcaactatgc ctatgccgag 420
 tccaacgtcc aattcatcaa aagccattgg ctgattaccg ccgttttccg tatgctgggt 480
 ttggcgtggg tctatttcgg cgcggttgcc aatgtgcctt tggctctggga tatggcggat 540
 atggcgatgg gcattatggc gtggatcaac cttgtcgcca tcctgctgct ctgcgccctg 600
 gcgtttatgc tgctgcgcga ttacaccgcc aagctgaaaa tgggcaaaga ccccgagttc 660
 aaactttccg aacatccggg cctgaaacgc cgtatcaa at ccgacgtttg gtaa 714

<210> 1850
 <211> 237
 <212> PRT
 <213> Neisseria meningitidis

<400> 1850
 Met Ile Pro Asp Val Phe Gly Gln Ile Phe Ser Gly Ala Phe Lys Phe
 1 5 10 15
 Asp Ala Ala Ala Gly Gly Leu Leu Gly Gly Leu Ile Ser Gln Thr Met
 20 25 30
 Met Met Gly Ile Lys Arg Gly Leu Tyr Ser Asn Glu Ala Gly Met Gly
 35 40 45
 Ser Ala Pro Asn Ala Ala Ala Ala Glu Val Lys His Pro Val Ser
 50 55 60
 Gln Gly Met Ile Gln Met Leu Gly Val Phe Val Asp Thr Ile Ile Val
 65 70 75 80
 Cys Ser Cys Thr Ala Phe Ile Ile Leu Ile Tyr Gln Gln Pro Tyr Gly
 85 90 95
 Asp Leu Ser Gly Ala Ala Leu Thr Gln Ala Ala Ile Val Ser Gln Val
 100 105 110
 Gly Gln Trp Gly Ala Gly Phe Leu Ala Val Ile Leu Phe Met Phe Ala
 115 120 125

Phe Ser Thr Val Ile Gly Asn Tyr Ala Tyr Ala Glu Ser Asn Val Gln
 130 135 140

Phe Ile Lys Ser His Trp Leu Ile Thr Ala Val Phe Arg Met Leu Val
 145 150 155 160

Leu Ala Trp Val Tyr Phe Gly Ala Val Ala Asn Val Pro Leu Val Trp
 165 170 175

Asp Met Ala Asp Met Ala Met Gly Ile Met Ala Trp Ile Asn Leu Val
 180 185 190

Ala Ile Leu Leu Leu Ser Pro Leu Ala Phe Met Leu Leu Arg Asp Tyr
 195 200 205

Thr Ala Lys Leu Lys Met Gly Lys Asp Pro Glu Phe Lys Leu Ser Glu
 210 215 220

His Pro Gly Leu Lys Arg Arg Ile Lys Ser Asp Val Trp
 225 230 235

<210> 1851
 <211> 714
 <212> DNA
 <213> Neisseria meningitidis

<400> 1851
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 ggcggccttac tcggcgggtct gatttcgcaa acgatgatga tgggcatcaa acgcggcctg 120
 tattccaacg aggcgggtat gggttccgcg ccgaacgccg ccgccgccgc cgaagtga 180
 caccctgttt cgcaagggtat gattcaaatg ctgggcgtgt ttgtcgatac catcatcggt 240
 tgttcttgca ccgccttcat catcttgatt taccaacagc cttacggcga tttgagcgg 300
 gcggcgctga cgcaggcggc gattgtcagc caagtggggc aatggggcgc gggcttcctc 360
 gcggtcatcc tgtttatgtt tgcttttcc accgttatcg gcaactatgc ctatgccgag 420
 tccaacgtcc aattcatcaa aagccattgg ctgattaccg ccgttttccg tatgctgggt 480
 ttggcgtggg tctatttcgg cgcgggtgcc aatgtgcctt tggctcggga tatggcggat 540
 atggcgatgg gcattatggc gtggatcaac cttgtcgcca tctgtctgct ctcgcccttg 600
 gcgtttatgc tgctgcgcga ttacaccgcc aagctgaaaa tgggcaaaga ccccgagttc 660
 aaactttccg aacatccggg cctgaaacgc cgtatcaa 714

<210> 1852
 <211> 237
 <212> PRT
 <213> Neisseria meningitidis

<400> 1852
 Met Ile Pro Asp Val Phe Gly Gln Ile Phe Ser Gly Ala Phe Lys Phe
 1 5 10 15

Asp Ala Ala Ala Gly Gly Leu Leu Gly Gly Leu Ile Ser Gln Thr Met
 20 25 30

Met Met Gly Ile Lys Arg Gly Leu Tyr Ser Asn Glu Ala Gly Met Gly
 35 40 45

Ser Ala Pro Asn Ala Ala Ala Ala Ala Glu Val Lys His Pro Val Ser
50 55 60

Gln Gly Met Ile Gln Met Leu Gly Val Phe Val Asp Thr Ile Ile Val
65 70 75 80

Cys Ser Cys Thr Ala Phe Ile Ile Leu Ile Tyr Gln Gln Pro Tyr Gly
85 90 95

Asp Leu Ser Gly Ala Ala Leu Thr Gln Ala Ala Ile Val Ser Gln Val
100 105 110

Gly Gln Trp Gly Ala Gly Phe Leu Ala Val Ile Leu Phe Met Phe Ala
115 120 125

Phe Ser Thr Val Ile Gly Asn Tyr Ala Tyr Ala Glu Ser Asn Val Gln
130 135 140

Phe Ile Lys Ser His Trp Leu Ile Thr Ala Val Phe Arg Met Leu Val
145 150 155 160

Leu Ala Trp Val Tyr Phe Gly Ala Val Ala Asn Val Pro Leu Val Trp
165 170 175

Asp Met Ala Asp Met Ala Met Gly Ile Met Ala Trp Ile Asn Leu Val
180 185 190

Ala Ile Leu Leu Leu Ser Pro Leu Ala Phe Met Leu Leu Arg Asp Tyr
195 200 205

Thr Ala Lys Leu Lys Met Gly Lys Asp Pro Glu Phe Lys Leu Ser Glu
210 215 220

His Pro Gly Leu Lys Arg Arg Ile Lys Ser Asp Val Trp
225 230 235

<210> 1853

<211> 942

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1853

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tgcctgactg tcgggcgcgc caaaatactc gccgtactgg ggcggtcggg ctgcggcaaa 120
tccaccctgc tgaatatgat tgcgggcacg gtccggcccg acggcggcga aattcggctg 180
aacggggaaa acattacctg tatgccgccc gaaaaacgcc gtatctcgct gatgtttcaa 240
gattacgcgc tgtttcccca tatgagtgcg ctggaaaata cggcattcgg tttgaaaatg 300
caaaaaatgc cgaaagccga agccgaacgc ctgccttgt cggcacttgc cgaagtcggg 360
ctggaaaacg aggcgcaccg caagcctgaa aaactttccg gaggcgagaa gcaacggttg 420
gcactggcgc gcgcttttgt tgtccgccct tccctgctgt tgctggatga atcgttttcc 480
agtttgaca cgcatttgcg cgaccggctg cgccgtatga ccgccgaacg catccgcaag 540
ggcggcatcc ctgccgtttt ggtaacgcat tcgcccgaag aggcctgcac ggcggcggac 600
gaaatcgccg tcatgcacga ggggaaaatc cttcaatgcg gtacgcccga aaccttgatt 660
caaacgcctg ccggcgtgca ggtcgcccgt ctgatggggc tgcccataac cgacgatgac 720

cgccatattc cgcaaaatgc cgtgtgcttg gacaatcatg gaacggaatg ccgtctgctg 780
 tccctcgctcc gcctgcccga ctcgctcccg ctttccgccg tccatcccga acacggcgag 840
 ctgaccttaa acctgactgt cggacaacat acggacggta tttccggaaa cggtacggtc 900
 cgcattccgcg tcgatgaagg gcgtatcgtc cgtttccgat ga 942

<210> 1854
 <211> 313
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1854
 Met Leu Glu Leu Asn Gly Leu Cys Lys Cys Phe Gly Gly Lys Thr Val
 1 5 10 15
 Ala Asp Asn Ile Cys Leu Thr Val Gly Arg Gly Lys Ile Leu Ala Val
 20 25 30
 Leu Gly Arg Ser Gly Cys Gly Lys Ser Thr Leu Leu Asn Met Ile Ala
 35 40 45
 Gly Ile Val Arg Pro Asp Gly Gly Glu Ile Arg Leu Asn Gly Glu Asn
 50 55 60
 Ile Thr Cys Met Pro Pro Glu Lys Arg Arg Ile Ser Leu Met Phe Gln
 65 70 75 80
 Asp Tyr Ala Leu Phe Pro His Met Ser Ala Leu Glu Asn Thr Ala Phe
 85 90 95
 Gly Leu Lys Met Gln Lys Met Pro Lys Ala Glu Ala Glu Arg Leu Ala
 100 105 110
 Leu Ser Ala Leu Ala Glu Val Gly Leu Glu Asn Glu Ala His Arg Lys
 115 120 125
 Pro Glu Lys Leu Ser Gly Gly Glu Lys Gln Arg Leu Ala Leu Ala Arg
 130 135 140
 Ala Leu Val Val Arg Pro Ser Leu Leu Leu Leu Asp Glu Ser Phe Ser
 145 150 155 160
 Ser Leu Asp Thr His Leu Arg Asp Arg Leu Arg Arg Met Thr Ala Glu
 165 170 175
 Arg Ile Arg Lys Gly Gly Ile Pro Ala Val Leu Val Thr His Ser Pro
 180 185 190
 Glu Glu Ala Cys Thr Ala Ala Asp Glu Ile Ala Val Met His Glu Gly
 195 200 205
 Lys Ile Leu Gln Cys Gly Thr Pro Glu Thr Leu Ile Gln Thr Pro Ala
 210 215 220
 Gly Val Gln Val Ala Arg Leu Met Gly Leu Pro Asn Thr Asp Asp Asp
 225 230 235 240

Arg His Ile Pro Gln Asn Ala Val Cys Leu Asp Asn His Gly Thr Glu
 245 250 255

Cys Arg Leu Leu Ser Leu Val Arg Leu Pro Asp Ser Leu Arg Leu Ser
 260 265 270

Ala Val His Pro Glu His Gly Glu Leu Thr Leu Asn Leu Thr Val Gly
 275 280 285

Gln His Thr Asp Gly Ile Ser Gly Asn Gly Thr Val Arg Ile Arg Val
 290 295 300

Asp Glu Gly Arg Ile Val Arg Phe Arg
 305 310

<210> 1855

<211> 939

<212> DNA

<213> Neisseria meningitidis

<400> 1855

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tccaccctgc tgaatataat tgcggggatt gtccggccgg acggcgggga aatatggctg 180
aacggagaaa acattaccgc tatgccgccc gaaaaacgcc gtatctcgt gatgtttcaa 240
gattacgcgc tgtttcccca tatgagtgcg ctggaaaatg cggcattcgg tttgaaaatg 300
caaaaaatgc cgaaagccga agccgaacgc ctgccatgg cggcacttgc cgaagtcgga 360
ctggaaaacg aggcgcaccg caagcctgaa aaactttccg gaggcgagaa gcaacggctg 420
gcgttggcgc gcgcttttgt tgtccgcctt tccctgctgc tgttggaaga atcgttttcc 480
agtttggaac cgcatttgcg cggcacgctg cgcggtatga ctgccgaacg tatccgaaac 540
ggcggcatcc ctgccgtttt ggtaacgcat tcgcccgaag aagcctgtac gacggcagac 600
gaaatcgccg tgatgcataa agggaggatt ctacaatacg gtacgcccga aacattggtc 660
aaaacaccat cctgcgtgca ggtcgcccga ctgatgggtt tgcccataac cgacgataac 720
cgccatattc cgcaacatgc ggtgcgtttc gaccaagacg gcatggagtg ccgcgtatta 780
tcccgtaact gtttgcccga atcggttcagc ctgtccgtcc tccatccgga acacggcatc 840
ctgtggctga acctcgatat gcggcacgcc ggggcggtat cgggcaagga tacggtacgc 900
atccatatcg aagaacggga aatcgtcgcg ttccgctga 939
  
```

<210> 1856

<211> 312

<212> PRT

<213> Neisseria meningitidis

<400> 1856

Met Leu Glu Leu Asn Gly Leu Cys Lys Arg Phe Gly Asn Lys Thr Val
 1 5 10 15

Ala Asp Asn Ile Cys Leu Thr Val Gly Arg Gly Lys Ile Leu Ala Val
 20 25 30

Leu Gly Arg Ser Gly Cys Gly Lys Ser Thr Leu Leu Asn Ile Ile Ala
 35 40 45

Gly Ile Val Arg Pro Asp Gly Gly Glu Ile Trp Leu Asn Gly Glu Asn

| 50 | | | | | 55 | | | | | 60 | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Thr | Arg | Met | Pro | Pro | Glu | Lys | Arg | Arg | Ile | Ser | Leu | Met | Phe | Gln |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Asp | Tyr | Ala | Leu | Phe | Pro | His | Met | Ser | Ala | Leu | Glu | Asn | Ala | Ala | Phe |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Gly | Leu | Lys | Met | Gln | Lys | Met | Pro | Lys | Ala | Glu | Ala | Glu | Arg | Leu | Ala |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Met | Ala | Ala | Leu | Ala | Glu | Val | Gly | Leu | Glu | Asn | Glu | Ala | His | Arg | Lys |
| | | | 115 | | | | 120 | | | | | | 125 | | |
| Pro | Glu | Lys | Leu | Ser | Gly | Gly | Glu | Lys | Gln | Arg | Leu | Ala | Leu | Ala | Arg |
| | | | 130 | | | | 135 | | | | | | 140 | | |
| Ala | Leu | Val | Val | Arg | Pro | Ser | Leu | Leu | Leu | Leu | Asp | Glu | Ser | Phe | Ser |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Ser | Leu | Asp | Thr | His | Leu | Arg | Gly | Thr | Leu | Arg | Arg | Met | Thr | Ala | Glu |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Arg | Ile | Arg | Asn | Gly | Gly | Ile | Pro | Ala | Val | Leu | Val | Thr | His | Ser | Pro |
| | | | 180 | | | | | 185 | | | | | | 190 | |
| Glu | Glu | Ala | Cys | Thr | Thr | Ala | Asp | Glu | Ile | Ala | Val | Met | His | Lys | Gly |
| | | | 195 | | | | 200 | | | | | | 205 | | |
| Arg | Ile | Leu | Gln | Tyr | Gly | Thr | Pro | Glu | Thr | Leu | Val | Lys | Thr | Pro | Ser |
| | | | 210 | | | | 215 | | | | | | 220 | | |
| Cys | Val | Gln | Val | Ala | Arg | Leu | Met | Gly | Leu | Pro | Asn | Thr | Asp | Asp | Asn |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Arg | His | Ile | Pro | Gln | His | Ala | Val | Arg | Phe | Asp | Gln | Asp | Gly | Met | Glu |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Cys | Arg | Val | Leu | Ser | Arg | Thr | Cys | Leu | Pro | Glu | Ser | Phe | Ser | Leu | Ser |
| | | | 260 | | | | | 265 | | | | | | 270 | |
| Val | Leu | His | Pro | Glu | His | Gly | Ile | Leu | Trp | Leu | Asn | Leu | Asp | Met | Arg |
| | | | 275 | | | | 280 | | | | | | 285 | | |
| His | Ala | Gly | Ala | Val | Ser | Gly | Lys | Asp | Thr | Val | Arg | Ile | His | Ile | Glu |
| | | | 290 | | | | 295 | | | | | | | 300 | |
| Glu | Arg | Glu | Ile | Val | Arg | Phe | Arg | | | | | | | | |
| 305 | | | | | 310 | | | | | | | | | | |

<210> 1857

<211> 939

<212> DNA

<213> *Neisseria meningitidis*

<400> 1857

```

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tccaccctgc tgaatatgat tgcgggcacg gtccggcggg acggcgggga aatatggctg 180
aatggggaaa acattaccgc tatgccgccc gaaaaacgcc gtatttcgct gatgtttcaa 240
gattacgcgc tgtttcccca tatgagtgcg ctggaaaatg cggcattcgg tttgaaaatg 300
caaaaaatgc cgaaagccga agccgaaagc ctgcccatgg cggcacttgc cgaagtcgga 360
ctggaaaacg aggcgcaccg caagcctgan aaactttccg gaggcgaaaa gcaacgggtg 420
gcactggcgc gcgcttttgt tgtccgccct tccctgctgc tgttgacga atcgttttcc 480
agtttggaca cgcatttgcg cgaccggctg cgccgcacga ctgccgaacg tatccgcaag 540
ggcggcatcc ctgccgtttt ggtaacgcac tcgccgaag aggcctgcac ggcggcagac 600
gaaatcgccg tcatgcacga ggggaaaatc cttcaatgcg gtacgccga aaccttgggt 660
caaacgcctg ccggcgctgc ggtcgcccat ctgatggggc tgcccaatac cgacgatgac 720
cgccatattc cgcaacatgc ggtgcgtttc gaccaagacg gcatggagtg ccgcgtatta 780
tcccgtaact gtttgcccga atcgttcagc ctgtccgtcc tccatccgga acacggcatc 840
ctgtggctga acctcgatat gccgcacgcc ggtgaaatat cgggaaacga tacggtagcg 900
atccatatcg aagacaggga aatcgtcgcg ttcgctga 939

```

<210> 1858

<211> 312

<212> PRT

<213> Neisseria meningitidis

<400> 1858

```

Met Leu Glu Leu Asn Gly Leu Cys Lys Arg Phe Gly Gly Lys Thr Val
  1                      5                      10                      15

```

```

Ala Asp Asp Ile Cys Leu Thr Val Gly Arg Gly Lys Ile Leu Ala Val
          20                      25                      30

```

```

Leu Gly Arg Ser Gly Cys Gly Lys Ser Thr Leu Leu Asn Met Ile Ala
      35                      40                      45

```

```

Gly Ile Val Arg Pro Asp Gly Gly Glu Ile Trp Leu Asn Gly Glu Asn
      50                      55                      60

```

```

Ile Thr Arg Met Pro Pro Glu Lys Arg Arg Ile Ser Leu Met Phe Gln
      65                      70                      75                      80

```

```

Asp Tyr Ala Leu Phe Pro His Met Ser Ala Leu Glu Asn Ala Ala Phe
          85                      90                      95

```

```

Gly Leu Lys Met Gln Lys Met Pro Lys Ala Glu Ala Glu Ser Leu Ala
      100                      105                      110

```

```

Met Ala Ala Leu Ala Glu Val Gly Leu Glu Asn Glu Ala His Arg Lys
      115                      120                      125

```

```

Pro Xaa Lys Leu Ser Gly Gly Glu Lys Gln Arg Leu Ala Leu Ala Arg
      130                      135                      140

```

```

Ala Leu Val Val Arg Pro Ser Leu Leu Leu Leu Asp Glu Ser Phe Ser
      145                      150                      155                      160

```

```

Ser Leu Asp Thr His Leu Arg Asp Arg Leu Arg Arg Met Thr Ala Glu
          165                      170                      175

```

Arg Ile Arg Lys Gly Gly Ile Pro Ala Val Leu Val Thr His Ser Pro
 180 185 190
 Glu Glu Ala Cys Thr Ala Ala Asp Glu Ile Ala Val Met His Glu Gly
 195 200 205
 Lys Ile Leu Gln Cys Gly Thr Pro Glu Thr Leu Val Gln Thr Pro Ala
 210 215 220
 Gly Val Gln Val Ala His Leu Met Gly Leu Pro Asn Thr Asp Asp Asp
 225 230 235 240
 Arg His Ile Pro Gln His Ala Val Arg Phe Asp Gln Asp Gly Met Glu
 245 250 255
 Cys Arg Val Leu Ser Arg Thr Cys Leu Pro Glu Ser Phe Ser Leu Ser
 260 265 270
 Val Leu His Pro Glu His Gly Ile Leu Trp Leu Asn Leu Asp Met Pro
 275 280 285
 His Ala Gly Glu Ile Ser Gly Asn Asp Thr Val Arg Ile His Ile Glu
 290 295 300
 Asp Arg Glu Ile Val Arg Phe Arg
 305 310

<210> 1859
 <211> 477
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1859
 atgggtgcag ataccgatgg cgacaaggat gttcggctta atcgaacggg tctcggtttt 60
 agcatactcc ggctgctgtt ccgcatcgga attgggatcg gtaagtctgc cgttcaggcc 120
 ttccaggtct ttaagctgct gatctgtacg gttgagcacc caaatcggtt tgccttgcca 180
 ctcggcggtc agcagctgac ccgcttcgat ttactgaca tccacctcga cggcagcacc 240
 ggaggccttg gctttttccg aagggaaaaa actggccaca aacggcggtg ccacacccaa 300
 tgctgccact ccgcccgcgc cgcaggctgc aagtgtcagg aaacggcggc ggccgttggt 360
 gatttcttga ttatccatta ttcagtcgct ctaatatattt gggaatgccg agccattaaa 420
 cattgcaatt ttaccagatt tgcagtata ctcaaagcat tatttaaaat aaggtaa 477

<210> 1860
 <211> 158
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1860
 Met Gly Ala Asp Thr Asp Gly Asp Lys Asp Val Arg Leu Asn Arg Thr
 1 5 10 15
 Gly Leu Val Phe Ser Ile Leu Arg Leu Leu Phe Arg Ile Gly Ile Gly
 20 25 30
 Ile Gly Lys Phe Ala Val Gln Ala Phe Gln Val Phe Lys Leu Leu Ile

| | | |
|---|-----|-----|
| 35 | 40 | 45 |
| Cys Thr Val Glu His Pro Asn Arg Phe Ala Leu Pro Leu Gly Gly Gln | | |
| 50 | 55 | 60 |
| Gln Leu Thr Arg Phe Asp Phe Thr Asp Ile His Leu Asp Gly Ser Thr | | |
| 65 | 70 | 75 |
| Gly Gly Leu Gly Phe Phe Arg Arg Glu Lys Thr Gly His Lys Arg Arg | | |
| 85 | 90 | 95 |
| Cys His Thr Gln Cys Cys His Ser Ala Arg Ala Ala Gly Arg Lys Cys | | |
| 100 | 105 | 110 |
| Gln Glu Thr Ala Ala Ala Val Val Asp Phe Leu Ile Ile His Tyr Ser | | |
| 115 | 120 | 125 |
| Val Val Leu Ile Phe Trp Glu Cys Arg Ala Ile Lys His Cys Asn Phe | | |
| 130 | 135 | 140 |
| Thr Gln Phe Ala Val Ile Leu Lys Ala Leu Phe Lys Ile Arg | | |
| 145 | 150 | 155 |

<210> 1861
 <211> 477
 <212> DNA
 <213> Neisseria meningitidis

<400> 1861
 atgggtgcag ataccgatgg cgacaaggat gttcggctta atcgaacggg tctcggtttt 60
 agcatactcc ggctgctggt ccgcatcgga attgggatcg gtaagttcgc cgttcaggcc 120
 tttcagggtct ttaagctgct gatctgtacg gttgagcacc caaatcgggt tgccttgcca 180
 ctccgcggtc agcagctgac ccgcttcgat ttactgaca tccacctcga cggcagcacc 240
 ggcggccttg gctttttccg aagggaaaaa actggccaca aacggcggtg ccacacccaa 300
 tgctgccact ccgcccgcgc cgcaggtcgc gagtgtcagg aaacggcggc ggccgttggt 360
 gatttcttga ttatccatta ttcagtcgtc ctaatatattt gggaataaccg agccattaaa 420
 cgttgcaatt ttaccagtt tgcagtgata ctcaaagcat tatttaaaat aaggtaa 477

<210> 1862
 <211> 158
 <212> PRT
 <213> Neisseria meningitidis

<400> 1862
 Met Gly Ala Asp Thr Asp Gly Asp Lys Asp Val Arg Leu Asn Arg Thr
 1 5 10 15
 Gly Leu Val Phe Ser Ile Leu Arg Leu Leu Phe Arg Ile Gly Ile Gly
 20 25 30
 Ile Gly Lys Phe Ala Val Gln Ala Phe Gln Val Phe Lys Leu Leu Ile
 35 40 45
 Cys Thr Val Glu His Pro Asn Arg Phe Ala Leu Pro Leu Gly Gly Gln
 50 55 60

Gln Leu Thr Arg Phe Asp Phe Thr Asp Ile His Leu Asp Gly Ser Thr
 65 70 75 80
 Gly Gly Leu Gly Phe Phe Arg Arg Glu Lys Thr Gly His Lys Arg Arg
 85 90 95
 Cys His Thr Gln Cys Cys His Ser Ala Arg Ala Ala Gly Arg Glu Cys
 100 105 110
 Gln Glu Thr Ala Ala Ala Val Val Asp Phe Leu Ile Ile His Tyr Ser
 115 120 125
 Val Val Leu Ile Phe Trp Glu Tyr Arg Ala Ile Lys Arg Cys Asn Phe
 130 135 140
 Thr Gln Phe Ala Val Ile Leu Lys Ala Leu Phe Lys Ile Arg
 145 150 155

<210> 1863
 <211> 477
 <212> DNA
 <213> Neisseria meningitidis

<400> 1863
 atgggtgcag ataccgatgg cgacaaggat gttcggotta atcgaacggg tctcgttttt 60
 agcatactcc ggctgctgtt ccgcacgcga attgggatcg gtaagttcgc cgttcaggcc 120
 ttccaggtct ttaagctgct gatctgtacg gttgagcacc caaatcggtt tgccttgcca 180
 ctccggcggtc agcaactgac ccgcttcgat ttactgaca tccacctcga cggcagcacc 240
 ggcggccttg gctttttccg aagggaaaaa actggccaca aacggcggtg ccacacccaa 300
 tgctgccact ccgccgcgc cgcaggtcgc gagtgtcagg aaacggcggc ggccgttggt 360
 gatttcttga ttatccatta ttcagtcgtc ctaatatattt gggaataaccg agccattaaa 420
 cgttgcaatt ttaccaggtt tgcagtgata ctcaaagcat tattttaaaat aaggtaa 477

<210> 1864
 <211> 158
 <212> PRT
 <213> Neisseria meningitidis

<400> 1864
 Met Gly Ala Asp Thr Asp Gly Asp Lys Asp Val Arg Leu Asn Arg Thr
 1 5 10 15
 Gly Leu Val Phe Ser Ile Leu Arg Leu Leu Phe Arg Ile Gly Ile Gly
 20 25 30
 Ile Gly Lys Phe Ala Val Gln Ala Phe Gln Val Phe Lys Leu Leu Ile
 35 40 45
 Cys Thr Val Glu His Pro Asn Arg Phe Ala Leu Pro Leu Gly Gly Gln
 50 55 60
 Gln Leu Thr Arg Phe Asp Phe Thr Asp Ile His Leu Asp Gly Ser Thr
 65 70 75 80

Gly Gly Leu Gly Phe Phe Arg Arg Glu Lys Thr Gly His Lys Arg Arg
85 90 95

Cys His Thr Gln Cys Cys His Ser Ala Arg Ala Ala Gly Arg Glu Cys
100 105 110

Gln Glu Thr Ala Ala Ala Val Val Asp Phe Leu Ile Ile His Tyr Ser
115 120 125

Val Val Leu Ile Phe Trp Glu Tyr Arg Ala Ile Lys Arg Cys Asn Phe
130 135 140

Thr Gln Phe Ala Val Ile Leu Lys Ala Leu Phe Lys Ile Arg
145 150 155

<210> 1865
<211> 1167
<212> DNA
<213> Neisseria gonorrhoeae

<400> 1865
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cagccgcggg aggcggagaa agccgcgccg gccgcgtccg gtgagaccca atccgccaac 120
gaaggcgggt cggtcgggtat cgccgtcaac gacaatgcct gcgaaccgat gaatctgacc 180
gtgccgagcg gacaggttgt gttcaatatt aaaaacaaca gcggccgcaa gctcgaatgg 240
gaaatcctga agggcgtgat ggtggtggac gaacgcgaaa atatcgcccc ggggctttcc 300
gacaaaatga accgtaacct gctgccgggc gaatacgaaa tgacctgcgg ccttttgacc 360
aatccgcgcg gcaagctggt ggtagccgac agcggcttta aagacaccgc caacgaagcg 420
gatttgaaaa aactgcccc accgctcgcc gactataaag cctacgttca aggcgaggtt 480
aaagagctgg cggcgaaaa caaaaccttt accgaagccg tcaaagcagg cgacattgaa 540
aaggcgaaat ccctgtttgc cgccacccgc gtccattacg aacgcacga accgattgcc 600
gagcttttca gcgaactcga ccccgtcac gatgcgtgtg aagacgactt caaagacggt 660
gcgaaagatg cggggtttac cggcttccac cgtatcgaa acgccccttg ggtggaaaaa 720
gacgtatccg gcgtgaagga aaccgcggcc aaactgatga ccgatgtcga agccctgcaa 780
aaagaaatcg acgcattggc gttccctccg ggcaaagtgg tcggcggcgc gtccgaactg 840
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aacgaaattc tggcgaaata ccgcacccaaa gacggttttg aaacctacga caagctgagc 1080
gaagccgacc gcaaagcatt acaggctcct attaacgcgc ttgccgaaga ccttgcccaa 1140
cttcgcggca tactcggtt gaaataa 1167

<210> 1866
<211> 388
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1866
Met Arg Lys Phe Asn Leu Thr Ala Leu Ser Val Met Leu Ala Leu Gly
1 5 10 15

Leu Thr Ala Cys Gln Pro Pro Glu Ala Glu Lys Ala Ala Pro Ala Ala
20 25 30

Ser Gly Glu Thr Gln Ser Ala Asn Glu Gly Gly Ser Val Gly Ile Ala
 35 40 45
 Val Asn Asp Asn Ala Cys Glu Pro Met Asn Leu Thr Val Pro Ser Gly
 50 55 60
 Gln Val Val Phe Asn Ile Lys Asn Asn Ser Gly Arg Lys Leu Glu Trp
 65 70 75 80
 Glu Ile Leu Lys Gly Val Met Val Val Asp Glu Arg Glu Asn Ile Ala
 85 90 95
 Pro Gly Leu Ser Asp Lys Met Asn Arg Asn Leu Leu Pro Gly Glu Tyr
 100 105 110
 Glu Met Thr Cys Gly Leu Leu Thr Asn Pro Arg Gly Lys Leu Val Val
 115 120 125
 Ala Asp Ser Gly Phe Lys Asp Thr Ala Asn Glu Ala Asp Leu Glu Lys
 130 135 140
 Leu Pro Gln Pro Leu Ala Asp Tyr Lys Ala Tyr Val Gln Gly Glu Val
 145 150 155 160
 Lys Glu Leu Ala Ala Lys Thr Lys Thr Phe Thr Glu Ala Val Lys Ala
 165 170 175
 Gly Asp Ile Glu Lys Ala Lys Ser Leu Phe Ala Ala Thr Arg Val His
 180 185 190
 Tyr Glu Arg Ile Glu Pro Ile Ala Glu Leu Phe Ser Glu Leu Asp Pro
 195 200 205
 Val Ile Asp Ala Cys Glu Asp Asp Phe Lys Asp Gly Ala Lys Asp Ala
 210 215 220
 Gly Phe Thr Gly Phe His Arg Ile Glu His Ala Leu Trp Val Glu Lys
 225 230 235 240
 Asp Val Ser Gly Val Lys Glu Thr Ala Ala Lys Leu Met Thr Asp Val
 245 250 255
 Glu Ala Leu Gln Lys Glu Ile Asp Ala Leu Ala Phe Pro Pro Gly Lys
 260 265 270
 Val Val Gly Gly Ala Ser Glu Leu Ile Glu Glu Ala Ala Gly Ser Lys
 275 280 285
 Ile Ser Gly Glu Glu Asp Arg Tyr Ser His Thr Asp Leu Ser Asp Phe
 290 295 300
 Gln Ala Asn Ala Asp Gly Ser Lys Lys Ile Val Asp Leu Phe Arg Pro
 305 310 315 320
 Leu Ile Glu Ala Lys Asn Lys Ala Leu Leu Glu Lys Thr Asp Thr Asn
 325 330 335

Phe Lys Gln Val Asn Glu Ile Leu Ala Lys Tyr Arg Thr Lys Asp Gly
340 345 350

Phe Glu Thr Tyr Asp Lys Leu Ser Glu Ala Asp Arg Lys Ala Leu Gln
355 360 365

Ala Pro Ile Asn Ala Leu Ala Glu Asp Leu Ala Gln Leu Arg Gly Ile
370 375 380

Leu Gly Leu Lys
385

<210> 1867

<211> 1167

<212> DNA

<213> *Neisseria meningitidis*

<400> 1867

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gagggcggtt cggtcagtat cgcgcgtcaac gacaatgcct gcgaaccgat ggaactgacc 180
gtgccgagcg gacaggttgt gttcaatatt aaaaacaaca gcggccgcaa gtcgaatgg 240
gaaatcctga aaggcgtgat ggtggtggac gagcgcgaaa acatcgcccc cggactttcc 300
gataaaatga ccgtcaccct gttgccgggc gaatacgaaa tgacttgccg tcttttgacc 360
aatccgcgcg gcaagctggt ggtaaccgac agcggcttta aagacaccgc caacgaagcg 420
gatttgaaaa aactgtccca accgctcgcc gactataaag cctacgttca aggcgaggtt 480
aaagagctgg tggcgaaaaac caaaactttt accgaagccg tcaaagcagg cgacattgaa 540
aaggcgaat ccctgtttgc cgacacccgc gtccattacg aacgcacgca accgattgcc 600
gagcttttca gcgaactcga ccccgtcac gatgcgcgtg aagacgactt caaagacggc 660
gcgaaagatg ccggatttac cggctttcac cgtatcgaat acgccctttg ggtggaaaaa 720
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aacgaaattc tggcgaaata ccggactaaa gacggttttg aaacctacga caagctgggc 1080
gaagccgacc gcaaagcggt acaggcctct attaacgcgc ttgccgaaga ccttgcccaa 1140
cttcgcggca tactcggtt gaaataa 1167
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<210> 1868

<211> 388

<212> PRT

<213> *Neisseria meningitidis*

<400> 1868

Met Arg Lys Phe Asn Leu Thr Ala Leu Ser Val Met Leu Ala Leu Gly
1 5 10 15

Leu Thr Ala Cys Gln Pro Pro Glu Ala Glu Lys Ala Ala Pro Ala Ala
20 25 30

Ser Gly Glu Ala Gln Thr Ala Asn Glu Gly Gly Ser Val Ser Ile Ala
35 40 45

Val Asn Asp Asn Ala Cys Glu Pro Met Glu Leu Thr Val Pro Ser Gly

| 50 | 55 | 60 |
|--|----|----|
| Gln Val Val Phe Asn Ile Lys Asn Asn Ser Gly Arg Lys Leu Glu Trp 65 70 75 80 | | |
| Glu Ile Leu Lys Gly Val Met Val Val Asp Glu Arg Glu Asn Ile Ala 85 90 95 | | |
| Pro Gly Leu Ser Asp Lys Met Thr Val Thr Leu Leu Pro Gly Glu Tyr 100 105 110 | | |
| Glu Met Thr Cys Gly Leu Leu Thr Asn Pro Arg Gly Lys Leu Val Val 115 120 125 | | |
| Thr Asp Ser Gly Phe Lys Asp Thr Ala Asn Glu Ala Asp Leu Glu Lys 130 135 140 | | |
| Leu Ser Gln Pro Leu Ala Asp Tyr Lys Ala Tyr Val Gln Gly Glu Val 145 150 155 160 | | |
| Lys Glu Leu Val Ala Lys Thr Lys Thr Phe Thr Glu Ala Val Lys Ala 165 170 175 | | |
| Gly Asp Ile Glu Lys Ala Lys Ser Leu Phe Ala Asp Thr Arg Val His 180 185 190 | | |
| Tyr Glu Arg Ile Glu Pro Ile Ala Glu Leu Phe Ser Glu Leu Asp Pro 195 200 205 | | |
| Val Ile Asp Ala Arg Glu Asp Asp Phe Lys Asp Gly Ala Lys Asp Ala 210 215 220 | | |
| Gly Phe Thr Gly Phe His Arg Ile Glu Tyr Ala Leu Trp Val Glu Lys 225 230 235 240 | | |
| Asp Val Ser Gly Val Lys Glu Ile Ala Ala Lys Leu Met Thr Asp Val 245 250 255 | | |
| Glu Ala Leu Gln Lys Glu Ile Asp Ala Leu Ala Phe Pro Pro Gly Lys 260 265 270 | | |
| Val Val Gly Gly Ala Ser Glu Leu Ile Glu Glu Val Ala Gly Ser Lys 275 280 285 | | |
| Ile Ser Gly Glu Glu Asp Arg Tyr Ser His Thr Asp Leu Ser Asp Phe 290 295 300 | | |
| Gln Ala Asn Val Asp Gly Ser Lys Lys Ile Val Asp Leu Phe Arg Pro 305 310 315 320 | | |
| Leu Ile Glu Ala Lys Asn Lys Ala Leu Leu Glu Lys Thr Asp Thr Asn 325 330 335 | | |
| Phe Lys Gln Val Asn Glu Ile Leu Ala Lys Tyr Arg Thr Lys Asp Gly 340 345 350 | | |
| Phe Glu Thr Tyr Asp Lys Leu Gly Glu Ala Asp Arg Lys Ala Leu Gln | | |

355

360

365

Ala Ser Ile Asn Ala Leu Ala Glu Asp Leu Ala Gln Leu Arg Gly Ile
 370 375 380

Leu Gly Leu Lys
 385

<210> 1869

<211> 1167

<212> DNA

<213> Neisseria meningitidis

<400> 1869

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gaggcggtt cggtcagtat cgcgcgtcaac gacaatgcct gcgaaccgat ggaactgacc 180
gtgccgagcg gacaggttgt gttcaatatt aaaaacaaca gcggccgcaa gtcgaatgg 240
gaaatcctga aaggcgtgat ggtggtggac gagcgcgaaa acatcgcccc cggactttcc 300
gataaaatga ccgtcaccct gttgccgggc gaatacgaaa tgacttgccg tcttttgacc 360
aatccgcgcg gcaagctggt ggtaaccgac agcggcttta aagacaccgc caacgaagcg 420
gatttgaaa aactgtccca accgctcgcc gactataaag cctatgttca aggcgaagtc 480
aaagagctgg tggcgaaaac caaaaccttt accgaagccg tcaaagcagg cgacattgaa 540
aaggcgaaat ccctgtttgc cgacaccgcg gtccattacg aacgcacga accgattgcc 600
gagcttttca gcgaactcga ccccgtcacg gatgcgcgtg aagacgactt caaagacggc 660
gcgaaagatg ccggatttac cggcttccac cgtatcgaat acgccccttg ggtggaaaaa 720
gacgtgtccg gcgtgaagga aattgcagcg aaactgatga ccgatgtcga agccctgcaa 780
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aacgaaattc tggcgaaata ccggactaaa gacggttttg aaacctacga caagctgggc 1080
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```

<210> 1870

<211> 388

<212> PRT

<213> Neisseria meningitidis

<400> 1870

Met Arg Lys Phe Asn Leu Thr Ala Leu Ser Val Met Leu Ala Leu Gly
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Leu Thr Ala Cys Gln Pro Pro Glu Ala Glu Lys Ala Ala Pro Ala Ala
 20 25 30

Ser Gly Glu Ala Gln Thr Ala Asn Glu Gly Gly Ser Val Ser Ile Ala
 35 40 45

Val Asn Asp Asn Ala Cys Glu Pro Met Glu Leu Thr Val Pro Ser Gly
 50 55 60

Gln Val Val Phe Asn Ile Lys Asn Asn Ser Gly Arg Lys Leu Glu Trp
 65 70 75 80

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Glu | Ile | Leu | Lys | Gly | Val | Met | Val | Val | Asp | Glu | Arg | Glu | Asn | Ile | Ala | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |
| Pro | Gly | Leu | Ser | Asp | Lys | Met | Thr | Val | Thr | Leu | Leu | Pro | Gly | Glu | Tyr | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| Glu | Met | Thr | Cys | Gly | Leu | Leu | Thr | Asn | Pro | Arg | Gly | Lys | Leu | Val | Val | |
| | | 115 | | | | | 120 | | | | | 125 | | | | |
| Thr | Asp | Ser | Gly | Phe | Lys | Asp | Thr | Ala | Asn | Glu | Ala | Asp | Leu | Glu | Lys | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| Leu | Ser | Gln | Pro | Leu | Ala | Asp | Tyr | Lys | Ala | Tyr | Val | Gln | Gly | Glu | Val | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | |
| Lys | Glu | Leu | Val | Ala | Lys | Thr | Lys | Thr | Phe | Thr | Glu | Ala | Val | Lys | Ala | |
| | | | | 165 | | | | | 170 | | | | | 175 | | |
| Gly | Asp | Ile | Glu | Lys | Ala | Lys | Ser | Leu | Phe | Ala | Asp | Thr | Arg | Val | His | |
| | | 180 | | | | | | 185 | | | | | 190 | | | |
| Tyr | Glu | Arg | Ile | Glu | Pro | Ile | Ala | Glu | Leu | Phe | Ser | Glu | Leu | Asp | Pro | |
| | 195 | | | | | | 200 | | | | | 205 | | | | |
| Val | Ile | Asp | Ala | Arg | Glu | Asp | Asp | Phe | Lys | Asp | Gly | Ala | Lys | Asp | Ala | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| Gly | Phe | Thr | Gly | Phe | His | Arg | Ile | Glu | Tyr | Ala | Leu | Trp | Val | Glu | Lys | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | |
| Asp | Val | Ser | Gly | Val | Lys | Glu | Ile | Ala | Ala | Lys | Leu | Met | Thr | Asp | Val | |
| | | | | 245 | | | | | 250 | | | | | 255 | | |
| Glu | Ala | Leu | Gln | Lys | Glu | Ile | Asp | Ala | Leu | Ala | Phe | Pro | Pro | Gly | Lys | |
| | | | 260 | | | | | 265 | | | | | | 270 | | |
| Val | Val | Gly | Gly | Ala | Ser | Glu | Leu | Ile | Glu | Glu | Val | Ala | Gly | Ser | Lys | |
| | | 275 | | | | | 280 | | | | | 285 | | | | |
| Ile | Ser | Gly | Glu | Glu | Asp | Arg | Tyr | Ser | His | Thr | Asp | Leu | Ser | Asp | Phe | |
| | 290 | | | | | 295 | | | | | 300 | | | | | |
| Gln | Ala | Asn | Val | Asp | Gly | Ser | Lys | Lys | Ile | Val | Asp | Leu | Phe | Arg | Pro | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | |
| Leu | Ile | Glu | Thr | Lys | Asn | Lys | Ala | Leu | Leu | Glu | Lys | Thr | Asp | Thr | Asn | |
| | | | | 325 | | | | | 330 | | | | | 335 | | |
| Phe | Lys | Gln | Val | Asn | Glu | Ile | Leu | Ala | Lys | Tyr | Arg | Thr | Lys | Asp | Gly | |
| | | 340 | | | | | | 345 | | | | | 350 | | | |
| Phe | Glu | Thr | Tyr | Asp | Lys | Leu | Gly | Glu | Ala | Asp | Arg | Lys | Ala | Leu | Gln | |
| | 355 | | | | | | 360 | | | | | 365 | | | | |
| Ala | Ser | Ile | Asn | Ala | Leu | Ala | Glu | Asp | Leu | Ala | Gln | Leu | Arg | Gly | Ile | |
| | 370 | | | | | 375 | | | | | 380 | | | | | |

Leu Gly Leu Lys

385

<210> 1871

<211> 1122

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1871

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gacaacgccg ccgaatggat tttggaactc gaccgcggac acggcattcc gtggaaaggc 180
aattactcgt cttggctgga gcagaaagaa aaacgcttgg aaaacgaggc gaaatccgaa 240
gccgcgcgcg tgaaggcgat gaagcaggaa ttggaatggg tgcgccaaaa tgccaaaggc 300
cgccaagcca agcccaaagc gcgtttggcg cgttttgaag aaatgagcaa ctacgaatac 360
caaaaacgca acgaaactca ggaaatcttt atccctgttg ccgagcgttt gggtaacgaa 420
gtgattgaat ttgtgaatgt ttccaaatcg ttccggcgata aagtgtgat tgacggtttg 480
agcttcaaag tgcggcgagg cgcgattgtc ggcacatcg gccgaacgg cgcgggtaaa 540
tcgacgctgt tcaaaatgat tgcgggcaaa gagcagcccg attcgggcga agtgaaaatc 600
gggcaaaccg tgaaaatgag cttgattgac caaagccgcg aaggtttgca aaacgacaaa 660
accgtgttcg acaacattgc cgaaggtcgc gatattttgc aggtcggaca gtttgaaatc 720
cccgcccgcc aatatttggg acgcttcaac tttaaaggca gcgaccaaag caaaatcgca 780
aggcagcttt ccggcggcga acgcggccgt ctgcacttgg caaaaacctt gttgggcggc 840
ggcaatgtgt tgcgtgctgga cgaaccgtcc aacgatctcg acgtggaaac cctgcgcgcg 900
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```

<210> 1872

<211> 373

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1872

```
Met Leu Leu Leu Asp Glu Pro Thr Asn His Leu Asp Ala Glu Ser Val
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```

```
Glu Trp Leu Glu Gln Phe Leu Val Arg Phe Pro Gly Thr Val Val Ala
                20                      25                      30
```

```
Val Thr His Asp Arg Tyr Phe Leu Asp Asn Ala Ala Glu Trp Ile Leu
        35                      40                      45
```

```
Glu Leu Asp Arg Gly His Gly Ile Pro Trp Lys Gly Asn Tyr Ser Ser
    50                      55                      60
```

```
Trp Leu Glu Gln Lys Glu Lys Arg Leu Glu Asn Glu Ala Lys Ser Glu
    65                      70                      75                      80
```

```
Ala Ala Arg Val Lys Ala Met Lys Gln Glu Leu Glu Trp Val Arg Gln
                85                      90                      95
```


Asn Ala Lys Gly Arg Gln Ala Lys Pro Lys Ala Arg Leu Ala Arg Phe
 100 105 110
 Glu Glu Met Ser Asn Tyr Glu Tyr Gln Lys Arg Asn Glu Thr Gln Glu
 115 120 125
 Ile Phe Ile Pro Val Ala Glu Arg Leu Gly Asn Glu Val Ile Glu Phe
 130 135 140
 Val Asn Val Ser Lys Ser Phe Gly Asp Lys Val Leu Ile Asp Gly Leu
 145 150 155 160
 Ser Phe Lys Val Pro Ala Gly Ala Ile Val Gly Ile Ile Gly Pro Asn
 165 170 175
 Gly Ala Gly Lys Ser Thr Leu Phe Lys Met Ile Ala Gly Lys Glu Gln
 180 185 190
 Pro Asp Ser Gly Glu Val Lys Ile Gly Gln Thr Val Lys Met Ser Leu
 195 200 205
 Ile Asp Gln Ser Arg Glu Gly Leu Gln Asn Asp Lys Thr Val Phe Asp
 210 215 220
 Asn Ile Ala Glu Gly Arg Asp Ile Leu Gln Val Gly Gln Phe Glu Ile
 225 230 235 240
 Pro Ala Arg Gln Tyr Leu Gly Arg Phe Asn Phe Lys Gly Ser Asp Gln
 245 250 255
 Ser Lys Ile Ala Arg Gln Leu Ser Gly Gly Glu Arg Gly Arg Leu His
 260 265 270
 Leu Ala Lys Thr Leu Leu Gly Gly Gly Asn Val Leu Leu Leu Asp Glu
 275 280 285
 Pro Ser Asn Asp Leu Asp Val Glu Thr Leu Arg Ala Leu Glu Asp Ala
 290 295 300
 Leu Leu Glu Phe Ala Gly Ser Val Met Val Ile Ser His Asp Arg Trp
 305 310 315 320
 Phe Leu Asp Arg Ile Ala Thr His Ile Leu Ala Cys Glu Gly Asp Ser
 325 330 335
 Lys Trp Val Phe Phe Asp Gly Asn Tyr Gln Glu Tyr Glu Ala Asp Lys
 340 345 350
 Lys Arg Arg Leu Gly Lys Glu Gly Ala Lys Pro Lys Arg Ile Lys Tyr
 355 360 365
 Lys Pro Val Thr Arg
 370

<210> 1873

<211> 3354

<212> DNA

<213> *Neisseria meningitidis*

<400> 1873

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ttgaacggcg cgggcaagtc caccgtgctg cggattatgg cgggcgtgga taaggaattt 180
gagggcgaa cgtgccgat gggcggcac aaaatcggct acctgccgca agagcctgag 240
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gccaaaatcg ataatttgtc cggcggtgaa aaacgcgcgc ttgccttgtg caaactcttg 540
ttgagcaagc ccgatatgct tttgctggac gagccgacca accacttgga tgcggaatcg 600
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cacgaccggtt ggttcctcga ccgcatcgcc acgcataatct tggcgtgtga aggcgactct 3240
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<210> 1874
 <211> 558
 <212> PRT
 <213> Neisseria meningitidis

<400> 1874
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 Gly Ala Lys Ile Gly Leu Leu Gly Leu Asn Gly Ala Gly Lys Ser Thr
 35 40 45
 Val Leu Arg Ile Met Ala Gly Val Asp Lys Glu Phe Glu Gly Glu Ala
 50 55 60
 Val Pro Met Gly Gly Ile Lys Ile Gly Tyr Leu Pro Gln Glu Pro Glu
 65 70 75 80
 Leu Asp Pro Glu Lys Thr Val Arg Glu Glu Val Glu Ser Gly Leu Gly
 85 90 95
 Glu Val Ala Ala Ala Gln Lys Arg Leu Glu Glu Val Tyr Ala Glu Tyr
 100 105 110
 Ala Asn Pro Asp Ala Asp Phe Asp Ala Leu Ala Glu Glu Gln Gly Arg
 115 120 125
 Leu Glu Ala Ile Ile Ala Ala Gly Ser Ser Thr Gly Gly Gly Ala Glu
 130 135 140
 His Glu Leu Glu Ile Ala Ala Asp Ala Leu Arg Leu Pro Glu Trp Asp
 145 150 155 160
 Ala Lys Ile Asp Asn Leu Ser Gly Gly Glu Lys Arg Arg Val Ala Leu
 165 170 175
 Cys Lys Leu Leu Leu Ser Lys Pro Asp Met Leu Leu Leu Asp Glu Pro
 180 185 190
 Thr Asn His Leu Asp Ala Glu Ser Val Glu Trp Leu Glu Gln Phe Leu
 195 200 205
 Val Arg Phe Pro Gly Thr Val Val Ala Val Thr His Asp Arg Tyr Phe
 210 215 220
 Leu Asp Asn Ala Ala Glu Trp Ile Leu Glu Leu Asp Arg Gly His Gly
 225 230 235 240
 Ile Pro Trp Lys Gly Asn Tyr Ser Ser Trp Leu Glu Gln Lys Glu Lys

| | | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|--|--|--|
| 245 | | | | | | | | 250 | | | | | | | | 255 | | | | | | | |
| Arg | Leu | Glu | Asn | Glu | Ala | Lys | Ser | Glu | Ala | Ala | Arg | Val | Lys | Ala | Met | | | | | | | | |
| | | | 260 | | | | | 265 | | | | | 270 | | | | | | | | | | |
| Lys | Gln | Glu | Leu | Glu | Trp | Val | Arg | Gln | Asn | Ala | Lys | Gly | Arg | Gln | Ala | | | | | | | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | | | | | | | |
| Lys | Ser | Lys | Ala | Arg | Leu | Ala | Arg | Phe | Glu | Glu | Met | Ser | Asn | Tyr | Glu | | | | | | | | |
| | 290 | | | | | 295 | | | | | 300 | | | | | | | | | | | | |
| Tyr | Gln | Lys | Arg | Asn | Glu | Thr | Gln | Glu | Ile | Phe | Ile | Pro | Val | Ala | Glu | | | | | | | | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | | | | | | | | |
| Arg | Leu | Gly | Asn | Glu | Val | Ile | Glu | Phe | Val | Asn | Val | Ser | Lys | Ser | Phe | | | | | | | | |
| | | | | 325 | | | | | 330 | | | | | 335 | | | | | | | | | |
| Gly | Asp | Lys | Val | Leu | Ile | Asp | Asp | Leu | Ser | Phe | Lys | Val | Pro | Ala | Gly | | | | | | | | |
| | | | 340 | | | | | 345 | | | | | 350 | | | | | | | | | | |
| Ala | Ile | Val | Gly | Ile | Ile | Gly | Pro | Asn | Gly | Ala | Gly | Lys | Ser | Thr | Leu | | | | | | | | |
| | | 355 | | | | | 360 | | | | | 365 | | | | | | | | | | | |
| Phe | Lys | Met | Ile | Ser | Gly | Lys | Glu | Gln | Pro | Asp | Ser | Gly | Glu | Val | Lys | | | | | | | | |
| | 370 | | | | | 375 | | | | | 380 | | | | | | | | | | | | |
| Ile | Gly | Gln | Thr | Val | Lys | Met | Ser | Leu | Ile | Asp | Gln | Ser | Arg | Glu | Gly | | | | | | | | |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 | | | | | | | | |
| Leu | Gln | Asn | Asp | Lys | Thr | Val | Phe | Asp | Asn | Ile | Ala | Glu | Gly | Arg | Asp | | | | | | | | |
| | | | | 405 | | | | | 410 | | | | | 415 | | | | | | | | | |
| Ile | Leu | Gln | Val | Gly | Gln | Phe | Glu | Ile | Pro | Ala | Arg | Gln | Tyr | Leu | Gly | | | | | | | | |
| | | | 420 | | | | | 425 | | | | | 430 | | | | | | | | | | |
| Arg | Phe | Asn | Phe | Lys | Gly | Ser | Asp | Gln | Ser | Lys | Ile | Ala | Gly | Gln | Leu | | | | | | | | |
| | | 435 | | | | | 440 | | | | | 445 | | | | | | | | | | | |
| Ser | Gly | Gly | Glu | Arg | Gly | Arg | Leu | His | Leu | Ala | Lys | Thr | Leu | Leu | Ser | | | | | | | | |
| | 450 | | | | | 455 | | | | | 460 | | | | | | | | | | | | |
| Gly | Gly | Asn | Val | Leu | Leu | Leu | Asp | Glu | Pro | Ser | Asn | Asp | Leu | Asp | Val | | | | | | | | |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 | | | | | | | | |
| Glu | Thr | Leu | Arg | Ala | Leu | Glu | Asp | Ala | Leu | Leu | Glu | Phe | Ala | Gly | Ser | | | | | | | | |
| | | | | 485 | | | | | 490 | | | | | 495 | | | | | | | | | |
| Val | Met | Val | Ile | Ser | His | Asp | Arg | Trp | Phe | Leu | Asp | Arg | Ile | Ala | Thr | | | | | | | | |
| | | | 500 | | | | | 505 | | | | | 510 | | | | | | | | | | |
| His | Ile | Leu | Ala | Cys | Glu | Gly | Asp | Ser | Lys | Trp | Val | Phe | Phe | Asp | Gly | | | | | | | | |
| | | 515 | | | | | 520 | | | | | 525 | | | | | | | | | | | |
| Asn | Tyr | Gln | Glu | Tyr | Glu | Ala | Asp | Lys | Lys | Arg | Arg | Leu | Gly | Glu | Glu | | | | | | | | |
| | 530 | | | | | 535 | | | | | 540 | | | | | | | | | | | | |
| Gly | Ala | Lys | Pro | Lys | Arg | Ile | Lys | Tyr | Lys | Pro | Val | Thr | Arg | | | | | | | | | | |

545

550

555

<210> 1875

<211> 1677

<212> DNA

<213> *Neisseria meningitidis*

<400> 1875

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gccaaaatcg ataatttgtc cggcggtgaa aaacgcgcgc tcgctttgtg caaactcttg 540
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<210> 1876

<211> 558

<212> PRT

<213> *Neisseria meningitidis*

<400> 1876

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 1              5              10              15

Pro Pro Gln Lys Thr Ile Ile Lys Asp Ile Ser Leu Ser Phe Phe Pro
      20              25              30

Gly Ala Lys Ile Gly Leu Leu Gly Leu Asn Gly Ala Gly Lys Ser Thr
      35              40              45

Val Leu Arg Ile Met Ala Gly Val Asp Lys Glu Phe Glu Gly Glu Ala
      50              55              60

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| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Val | Pro | Met | Gly | Gly | Ile | Lys | Ile | Gly | Tyr | Leu | Pro | Gln | Glu | Pro | Glu | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | |
| Leu | Asp | Pro | Glu | Lys | Thr | Val | Arg | Glu | Glu | Val | Glu | Ser | Gly | Leu | Gly | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |
| Glu | Val | Ala | Ala | Ala | Gln | Lys | Arg | Leu | Glu | Glu | Val | Tyr | Ala | Glu | Tyr | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| Ala | Asn | Pro | Asp | Ala | Asp | Phe | Asp | Ala | Leu | Ala | Glu | Glu | Gln | Gly | Arg | |
| | | 115 | | | | | 120 | | | | | | 125 | | | |
| Leu | Glu | Ala | Ile | Ile | Ala | Ala | Gly | Ser | Ser | Thr | Gly | Gly | Gly | Ala | Glu | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| His | Glu | Leu | Glu | Ile | Ala | Ala | Asp | Ala | Leu | Arg | Leu | Pro | Glu | Trp | Asp | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | |
| Ala | Lys | Ile | Asp | Asn | Leu | Ser | Gly | Gly | Glu | Lys | Arg | Arg | Val | Ala | Leu | |
| | | | | 165 | | | | | 170 | | | | | 175 | | |
| Cys | Lys | Leu | Leu | Leu | Ser | Lys | Pro | Asp | Met | Leu | Leu | Leu | Asp | Glu | Pro | |
| | | 180 | | | | | | 185 | | | | | 190 | | | |
| Thr | Asn | His | Leu | Asp | Ala | Glu | Ser | Val | Glu | Trp | Leu | Glu | Gln | Phe | Leu | |
| | 195 | | | | | | 200 | | | | | 205 | | | | |
| Val | Arg | Phe | Pro | Gly | Thr | Val | Val | Ala | Val | Thr | His | Asp | Arg | Tyr | Phe | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| Leu | Asp | Asn | Ala | Ala | Glu | Trp | Ile | Leu | Glu | Leu | Asp | Arg | Gly | His | Gly | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | |
| Ile | Pro | Trp | Lys | Gly | Asn | Tyr | Ser | Ser | Trp | Leu | Glu | Gln | Lys | Glu | Lys | |
| | | | | 245 | | | | | 250 | | | | | 255 | | |
| Arg | Leu | Glu | Asn | Glu | Ala | Lys | Ser | Glu | Ala | Ala | Arg | Val | Lys | Ala | Met | |
| | | | 260 | | | | | 265 | | | | | 270 | | | |
| Lys | Gln | Glu | Leu | Glu | Trp | Val | Arg | Gln | Asn | Ala | Lys | Gly | Arg | Gln | Ala | |
| | | 275 | | | | | 280 | | | | | 285 | | | | |
| Lys | Ser | Lys | Ala | Arg | Leu | Ala | Arg | Phe | Glu | Glu | Met | Ser | Asn | Tyr | Glu | |
| | 290 | | | | | 295 | | | | | 300 | | | | | |
| Tyr | Gln | Lys | Arg | Asn | Glu | Thr | Gln | Glu | Ile | Phe | Ile | Pro | Val | Ala | Glu | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | |
| Arg | Leu | Gly | Asn | Glu | Val | Ile | Glu | Phe | Val | Asn | Val | Ser | Lys | Ser | Phe | |
| | | | | 325 | | | | 330 | | | | | | 335 | | |
| Gly | Asp | Lys | Val | Leu | Ile | Asp | Asp | Leu | Ser | Phe | Lys | Val | Pro | Ala | Gly | |
| | | | 340 | | | | | 345 | | | | | 350 | | | |
| Ala | Ile | Val | Gly | Ile | Ile | Gly | Pro | Asn | Gly | Ala | Gly | Lys | Ser | Thr | Leu | |
| | | 355 | | | | | 360 | | | | | 365 | | | | |

| | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | Lys | Met | Ile | Ala | Gly | Lys | Glu | Gln | Pro | Asp | Ser | Gly | Glu | Val | Lys | 370 | 375 | 380 | |
| Ile | Gly | Gln | Thr | Val | Lys | Met | Ser | Leu | Ile | Asp | Gln | Ser | Arg | Glu | Gly | 385 | 390 | 395 | 400 |
| Leu | Gln | Asn | Asp | Lys | Thr | Val | Phe | Asp | Asn | Ile | Ala | Glu | Gly | Arg | Asp | 405 | 410 | 415 | |
| Ile | Leu | Gln | Val | Gly | Gln | Phe | Glu | Ile | Pro | Ala | Arg | Gln | Tyr | Leu | Gly | 420 | 425 | 430 | |
| Arg | Phe | Asn | Phe | Lys | Gly | Ser | Asp | Gln | Ser | Lys | Ile | Thr | Gly | Gln | Leu | 435 | 440 | 445 | |
| Ser | Gly | Gly | Glu | Arg | Gly | Arg | Leu | His | Leu | Ala | Lys | Thr | Leu | Leu | Gly | 450 | 455 | 460 | |
| Gly | Gly | Asn | Val | Leu | Leu | Leu | Asp | Glu | Pro | Ser | Asn | Asp | Leu | Asp | Val | 465 | 470 | 475 | 480 |
| Glu | Thr | Leu | Arg | Ala | Leu | Glu | Asp | Ala | Leu | Leu | Glu | Phe | Ala | Gly | Ser | 485 | 490 | 495 | |
| Val | Met | Val | Ile | Ser | His | Asp | Arg | Trp | Phe | Leu | Asp | Arg | Ile | Ala | Thr | 500 | 505 | 510 | |
| His | Ile | Leu | Ala | Cys | Glu | Gly | Asp | Ser | Lys | Trp | Val | Phe | Phe | Asp | Gly | 515 | 520 | 525 | |
| Asn | Tyr | Gln | Glu | Tyr | Glu | Ala | Asp | Lys | Lys | Arg | Arg | Leu | Gly | Glu | Glu | 530 | 535 | 540 | |
| Gly | Thr | Lys | Pro | Lys | Arg | Ile | Lys | Tyr | Lys | Pro | Val | Thr | Arg | | | 545 | 550 | 555 | |

<210> 1877

<211> 1170

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1877

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cagcgcgagg cttgggacaa attccaaaaa ctcaataccg agctgaaccg ttgaaaaacg 180
gaagtcgccg ctacgaaagc gcagatttcc cgtttcgtat cggggaacta taaaaacagc 240
cggccgaatg cggttgcctt gttcctgaaa aacgcggaac cgggtcagaa aaaccgcttt 300
ttgcgttata cgcgttatgt aaacgcctcc aatcgggaag ttgtcaagga tttggaaaaa 360
cagcagaagg ctttggcggt acaagagcag aaaatcaaca atgagcttgc ccgtttgaag 420
aaaattcagg caaacgtgca atccctgctg aaaaaacagg gtgtaaccga tgcggcgga 480
cagacggaaa gccgcagaca gaatgcaaaa atctccaaag atgcccgaaa actgctggaa 540
cagaaaggga acgagcagca gctgaacaag ctcttgagca atttggagaa aaaaaagcc 600
gaacaccgca ttcaggatgc ggaagcaaaa agaaaattgg ctgaagccaa actggcggca 660
gccgaaaaag ccagaaaaga agcggcgagc cagaaggctg aagcgcgacg tgcggaaatg 720
tccaacctga ccgccgaaga caggaacatc caagcgctt cggttatggg tatcggcagt 780
gccgacggtt tcagccgcat gcagggacgt ttgaaaaaac cggttgacgg tgtgccgacc 840

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ttgagcgaaa tttccgccgg caagggttat acggtcgcgg caggaagcaa aatcggcacg 1080
agcgggtcgc tgccggacgg ggaagagggg ctttacctgc aaatacgta tcgaggtcag 1140
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<210> 1878

<211> 389

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1878

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Met Leu Leu His Val Ser Asn Ser Leu Lys Gln Leu Gln Glu Glu Arg
 1             5             10             15

Ile Arg Gln Glu Arg Ile Arg Gln Glu Arg Ile Arg Gln Ala Arg Gly
          20             25             30

Asn Leu Ala Ser Val Asn Arg Lys Gln Arg Glu Ala Trp Asp Lys Phe
          35             40             45

Gln Lys Leu Asn Thr Glu Leu Asn Arg Leu Lys Thr Glu Val Ala Ala
          50             55             60

Thr Lys Ala Gln Ile Ser Arg Phe Val Ser Gly Asn Tyr Lys Asn Ser
          65             70             75             80

Arg Pro Asn Ala Val Ala Leu Phe Leu Lys Asn Ala Glu Pro Gly Gln
          85             90             95

Lys Asn Arg Phe Leu Arg Tyr Thr Arg Tyr Val Asn Ala Ser Asn Arg
          100            105            110

Glu Val Val Lys Asp Leu Glu Lys Gln Gln Lys Ala Leu Ala Val Gln
          115            120            125

Glu Gln Lys Ile Asn Asn Glu Leu Ala Arg Leu Lys Lys Ile Gln Ala
          130            135            140

Asn Val Gln Ser Leu Leu Lys Lys Gln Gly Val Thr Asp Ala Ala Glu
          145            150            155            160

Gln Thr Glu Ser Arg Arg Gln Asn Ala Lys Ile Ser Lys Asp Ala Arg
          165            170            175

Lys Leu Leu Glu Gln Lys Gly Asn Glu Gln Gln Leu Asn Lys Leu Leu
          180            185            190

Ser Asn Leu Glu Lys Lys Lys Ala Glu His Arg Ile Gln Asp Ala Glu
          195            200            205

Ala Lys Arg Lys Leu Ala Glu Ala Lys Leu Ala Ala Ala Glu Lys Ala
          210            215            220

Arg Lys Glu Ala Ala Gln Gln Lys Ala Glu Ala Arg Arg Ala Glu Met

```


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gacggggaag aggggcttta cctgcaaata cgttatcaag gtcagggtatt gaacccttcg 1140
agctggatac gttga 1155

<210> 1880
<211> 384
<212> PRT
<213> Neisseria meningitidis

<400> 1880
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Asn Arg Lys Gln Arg Glu Ala Trp Asp Lys Phe Gln Lys Leu Asn Thr
35 40 45
Glu Leu Asn Arg Leu Lys Thr Glu Val Ala Ala Thr Lys Ala Gln Ile
50 55 60
Ser Arg Phe Val Ser Gly Asn Tyr Lys Asn Ser Gln Pro Asn Ala Val
65 70 75 80
Ala Leu Phe Leu Lys Asn Ala Glu Pro Gly Gln Lys Asn Arg Phe Leu
85 90 95
Arg Tyr Thr Arg Tyr Val Asn Ala Ser Asn Arg Glu Val Val Lys Asp
100 105 110
Leu Glu Lys Gln Gln Lys Ala Leu Ala Val Gln Glu Gln Lys Ile Asn
115 120 125
Asn Glu Leu Ala Arg Leu Lys Lys Ile Gln Ala Asn Val Gln Ser Leu
130 135 140
Leu Lys Lys Gln Gly Val Thr Asp Ala Ala Glu Gln Thr Glu Ser Arg
145 150 155 160
Arg Gln Asn Ala Lys Ile Ala Lys Asp Ala Arg Lys Leu Leu Glu Gln
165 170 175
Lys Gly Asn Glu Gln Gln Leu Asn Lys Leu Leu Ser Asn Leu Glu Lys
180 185 190
Lys Lys Ala Glu His Arg Ile Gln Asp Ala Glu Ala Lys Arg Lys Leu
195 200 205
Ala Glu Ala Arg Leu Ala Ala Ala Glu Lys Ala Arg Lys Glu Ala Ala
210 215 220
Gln Gln Lys Ala Glu Ala Arg Arg Ala Glu Met Ser Asn Leu Thr Ala
225 230 235 240

<210> 1882

<211> 389

<212> PRT

<213> *Neisseria meningitidis*

<400> 1882

Met Leu Leu His Val Ser Asn Ser Leu Lys Gln Leu Gln Glu Glu Arg
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20 25 30

Asn Leu Ala Ser Val Asn Arg Lys Gln Arg Glu Ala Trp Asp Lys Phe
35 40 45

Gln Lys Leu Asn Thr Glu Leu Asn Arg Leu Lys Thr Glu Val Ala Ala
50 55 60

Thr Lys Ala Gln Ile Ser Arg Phe Val Ser Gly Asn Tyr Lys Asn Ser
65 70 75 80

Gln Pro Asn Ala Val Ala Leu Phe Leu Lys Asn Ala Glu Pro Gly Gln
85 90 95

Lys Asn Arg Phe Leu Arg Tyr Thr Arg Tyr Val Asn Ala Ser Asn Arg
100 105 110

Glu Val Val Lys Asp Leu Glu Lys Gln Gln Lys Ala Leu Ala Val Gln
115 120 125

Glu Gln Lys Ile Asn Asn Glu Leu Ala Arg Leu Lys Lys Ile Gln Ala
130 135 140

Asn Val Gln Ser Leu Leu Lys Lys Gln Gly Val Thr Asp Ala Ala Glu
145 150 155 160

Gln Thr Glu Ser Arg Arg Gln Asn Ala Lys Ile Ala Lys Asp Ala Arg
165 170 175

Lys Leu Leu Glu Gln Lys Gly Asn Glu Gln Gln Leu Asn Lys Leu Leu
180 185 190

Ser Asn Leu Glu Lys Lys Lys Ala Glu His Arg Ile Gln Asp Ala Glu
195 200 205

Ala Lys Arg Lys Leu Ala Glu Ala Arg Leu Ala Ala Ala Glu Lys Ala
210 215 220

Arg Lys Glu Ala Ala Gln Gln Lys Ala Glu Ala Arg Arg Ala Glu Met
225 230 235 240

Ser Asn Leu Thr Ala Glu Asp Arg Asn Ile Gln Ala Pro Ser Val Met
245 250 255

Gly Ile Gly Ser Ala Asp Gly Phe Ser Arg Met Gln Gly Arg Leu Lys

260 265 270
 Lys Pro Val Asp Gly Val Pro Thr Gly Leu Phe Gly Gln Asn Arg Ser
 275 280 285
 Gly Gly Asp Val Trp Lys Gly Val Phe Tyr Ser Thr Ala Pro Ala Thr
 290 295 300
 Val Glu Ser Ile Ala Pro Gly Thr Val Ser Tyr Ala Asp Glu Leu Asp
 305 310 315 320
 Gly Tyr Gly Lys Val Val Val Val Asp His Gly Glu Asn Tyr Ile Ser
 325 330 335
 Ile Tyr Ala Gly Leu Ser Glu Ile Ser Val Gly Lys Gly Tyr Met Val
 340 345 350
 Ala Ala Gly Ser Lys Ile Gly Ser Ser Gly Ser Leu Pro Asp Gly Glu
 355 360 365
 Glu Gly Leu Tyr Leu Gln Ile Arg Tyr Gln Gly Gln Val Leu Asn Pro
 370 375 380
 Ser Ser Trp Ile Arg
 385

<210> 1883
 <211> 612
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1883
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 acgggcaaaag agttgcagga cgacatcaac aacgatgccg ccgcgctgga aaaatttgaa 180
 accatccgcg catatggcgc gctgaaaatg ggtttgatca gcgacgtatc cgaagccgcc 240
 gccgcgcgc gcacgccgaa accgccttc gtcgcgcccgc ccgccgatta caccgcctcc 300
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 aaactgcacc acgctatgat gggcatcgcc tcggtcgcca tcgccgccgc cgtgctcggc 420
 acgctggtca accttgccgc aggcggcgga acgcgtaaaag aagtgcgctt cgggcatccg 480
 tcaggtacgc tgcgtgtcgg tgctgccgcc gaatgtcagg acggacaatg gacggccgcc 540
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<210> 1884
 <211> 203
 <212> PRT
 <213> *Neisseria gonorrhoeae*

<400> 1884
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 1 5 10 15
 Gly Arg Leu Lys Ala Thr Leu Ile Asn Ala Gly Ile Pro Thr Val Phe

| | | |
|---|-----|-----|
| 20 | 25 | 30 |
| Leu Asn Ala Ala Asp Leu Gly Tyr Thr Gly Lys Glu Leu Gln Asp Asp | | |
| 35 | 40 | 45 |
| Ile Asn Asn Asp Ala Ala Ala Leu Glu Lys Phe Glu Thr Ile Arg Ala | | |
| 50 | 55 | 60 |
| Tyr Gly Ala Leu Lys Met Gly Leu Ile Ser Asp Val Ser Glu Ala Ala | | |
| 65 | 70 | 75 |
| Ala Arg Ala Arg Thr Pro Lys Pro Ala Phe Val Ala Pro Ala Ala Asp | | |
| 85 | 90 | 95 |
| Tyr Thr Ala Ser Ser Gly Lys Thr Val Asn Ala Ala Asp Ile Asp Leu | | |
| 100 | 105 | 110 |
| Pro Val Arg Ala Leu Ser Met Gly Lys Leu His His Ala Met Met Gly | | |
| 115 | 120 | 125 |
| Ile Ala Ser Val Ala Ile Ala Ala Val Leu Gly Thr Leu Val Asn | | |
| 130 | 135 | 140 |
| Leu Ala Ala Gly Gly Gly Thr Arg Lys Glu Val Arg Phe Gly His Pro | | |
| 145 | 150 | 155 |
| Ser Gly Thr Leu Arg Val Gly Ala Ala Ala Glu Cys Gln Asp Gly Gln | | |
| 165 | 170 | 175 |
| Trp Thr Ala Ala Lys Ala Val Met Ser Arg Ser Ala Arg Val Ile Met | | |
| 180 | 185 | 190 |
| Glu Ser Trp Val Arg Val Pro Asp Asp Cys Phe | | |
| 195 | 200 | |

<210> 1885
 <211> 618
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1885
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 acaggcaaag agttgcaaga cgacatcaac aacgatgccg cggctttgga aaaattcgag 180
 aaaatccgcg cttacggtgc gctgaaaatg ggtctgatca gcgacgtatc cgaagctgcc 240
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 catccttccg gcacattgcg cgtcgggtgca gccgccgaat gtcaggacgg acaatggacg 540
 gccaccaaag cggtcatgag ccgtagcgca cgcgtgatga tggaaggttg ggtcagggtg 600
 cctgaggatt gtttttaa 618

<210> 1886
 <211> 205

<212> PRT

<213> Neisseria meningitidis

<400> 1886

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Met Phe Pro Thr Gly Asn Leu Val Asp Glu Ile Asp Val Pro Asn Ile
  1           5           10          15

Gly Arg Leu Lys Ala Thr Leu Ile Asn Ala Gly Ile Pro Thr Val Phe
          20           25          30

Leu Asn Ala Ala Asp Leu Gly Tyr Thr Gly Lys Glu Leu Gln Asp Asp
          35           40          45

Ile Asn Asn Asp Ala Ala Ala Leu Glu Lys Phe Glu Lys Ile Arg Ala
          50           55          60

Tyr Gly Ala Leu Lys Met Gly Leu Ile Ser Asp Val Ser Glu Ala Ala
          65           70          75          80

Ala Arg Ala His Thr Pro Lys Val Ala Phe Val Ala Pro Ala Ala Asp
          85           90          95

Tyr Thr Ala Ser Ser Gly Lys Thr Val Asn Ala Ala Asp Ile Asp Leu
          100          105          110

Leu Val Arg Ala Leu Ser Met Gly Lys Leu His His Ala Met Met Gly
          115          120          125

Thr Ala Ser Val Ala Ile Ala Thr Ala Ala Ala Val Pro Gly Thr Leu
          130          135          140

Val Asn Leu Ala Ala Gly Gly Gly Thr Arg Lys Glu Val Arg Phe Gly
          145          150          155          160

His Pro Ser Gly Thr Leu Arg Val Gly Ala Ala Ala Glu Cys Gln Asp
          165          170          175

Gly Gln Trp Thr Ala Thr Lys Ala Val Met Ser Arg Ser Ala Arg Val
          180          185          190

Met Met Glu Gly Trp Val Arg Val Pro Glu Asp Cys Phe
          195          200          205
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<210> 1887

<211> 618

<212> DNA

<213> Neisseria meningitidis

<400> 1887

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acgggcaaag agttgcaaga cgacatcaac aacgatgccg cagctttgga aaaattcgag 180
aaaatccgcg cttacgggtgc gctgaaaatg ggtctgatca gcgacgtatc cgaagctgcc 240
gcccgcgcgc acacgcgcgaa agtcgccttc gtcgcgcccgc ccgccgatta caccgcctcc 300
agtggcaaaa ccgtgaatgc cgccgacatc gatttgctgg tacgcgcctt gagcatgggc 360
aaattgcacc acgcgatgat gggtaccgcc tctgttgcca ttgcgaccgc cgccgccgtg 420
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cccggtacgc tggtaacct tgccgcaggc ggcggaacgc gtaaagaagt gcgcttcggg 480
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 gccaccaaag cggttatgag ccgcagcgca cgcgtgatga tggaagggtg ggtcagggtg 600
 ccggaagatt gtttttaa 618

<210> 1888
 <211> 205
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1888
 Met Phe Pro Thr Gly Asn Leu Val Asp Glu Ile Asp Val Pro Asn Ile
 1 5 10 15
 Gly Arg Leu Lys Ala Thr Leu Ile Asn Ala Gly Ile Pro Thr Val Phe
 20 25 30
 Leu Asn Ala Ala Asp Leu Gly Tyr Thr Gly Lys Glu Leu Gln Asp Asp
 35 40 45
 Ile Asn Asn Asp Ala Ala Ala Leu Glu Lys Phe Glu Lys Ile Arg Ala
 50 55 60
 Tyr Gly Ala Leu Lys Met Gly Leu Ile Ser Asp Val Ser Glu Ala Ala
 65 70 75 80
 Ala Arg Ala His Thr Pro Lys Val Ala Phe Val Ala Pro Ala Ala Asp
 85 90 95
 Tyr Thr Ala Ser Ser Gly Lys Thr Val Asn Ala Ala Asp Ile Asp Leu
 100 105 110
 Leu Val Arg Ala Leu Ser Met Gly Lys Leu His His Ala Met Met Gly
 115 120 125
 Thr Ala Ser Val Ala Ile Ala Thr Ala Ala Ala Val Pro Gly Thr Leu
 130 135 140
 Val Asn Leu Ala Ala Gly Gly Gly Thr Arg Lys Glu Val Arg Phe Gly
 145 150 155 160
 His Pro Ser Gly Thr Leu Arg Val Gly Ala Ala Ala Glu Cys Gln Asp
 165 170 175
 Gly Gln Trp Thr Ala Thr Lys Ala Val Met Ser Arg Ser Ala Arg Val
 180 185 190
 Met Met Glu Gly Trp Val Arg Val Pro Glu Asp Cys Phe
 195 200 205

<210> 1889
 <211> 348
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1889

```
atgttgctcc atcaatgcga caaagcgcga catatgcgtc cctttctgct cggcgggcag 60
ataaaccgtc atcgtcaggc gagcaaccgt ggattgtgtt ccttcggcgg ttttcagggt 120
aatcggaag cgcaggtctt taatgccgac ctgattgata ggcaggttgc gcaaattctt 180
gctggattgc acgtctgcaa tggcgttcat gcgttggttt tccttaatat tcagataatt 240
attgagatgt gtgtattgta tggcaggcag atgccgtctg aaaaaacgct gtcggccgcc 300
tgcctgcaaa tgcgagatta taccattgc ttttggcggc tgcattga 348
```

<210> 1890

<211> 115

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1890

```
Met Leu Leu His Gln Cys Asp Lys Ala Arg His Met Arg Pro Phe Leu
  1             5             10             15
```

```
Leu Gly Gly Gln Ile Asn Arg His Arg Gln Ala Ser Asn Arg Gly Leu
      20             25             30
```

```
Cys Ser Phe Gly Gly Phe Gln Gly Asn Arg Glu Ala Gln Val Phe Asn
      35             40             45
```

```
Ala Asp Leu Ile Asp Arg Gln Val Ala Gln Ile Ser Ala Gly Leu His
      50             55             60
```

```
Val Cys Asn Gly Val His Ala Leu Phe Val Leu Asn Ile Gln Ile Ile
      65             70             75             80
```

```
Ile Glu Met Cys Val Leu Tyr Gly Arg Gln Met Pro Ser Glu Lys Thr
      85             90             95
```

```
Leu Ser Ala Ala Cys Leu Gln Met Arg Asp Tyr Ile Thr Cys Phe Trp
      100            105            110
```

```
Arg Leu His
      115
```

<210> 1891

<211> 336

<212> DNA

<213> *Neisseria meningitidis*

<400> 1891

```
atgttgctcc atcaatgcga caaaacgcga catatgcgtc cccttctgct cagcaggcag 60
gtaaaccgtc atggtcagac gggcaatggt ggactggatg ccttctgcag tttgcagggt 120
aatcggaag cgcaggtctt tgataccgac ctgattgata ggcagattgc gcaaattctg 180
gctggattgc acgtctgcaa tagtgttcat gagttgtttt tccttaatat tcatgtaatt 240
gttgagatgt gtgcatggta tggcgtttcc gccggggaat ataccgtcaa tctgcaaatt 300
cgagattata taccctgctt ttagcagctg cattga 336
```

<210> 1892

<211> 110

<212> PRT

<213> Neisseria meningitidis

<400> 1892

```
Met Leu Leu His Gln Cys Asp Lys Thr Arg His Met Arg Pro Leu Leu
 1              5              10              15

Leu Ser Arg Gln Val Asn Arg His Gly Gln Thr Gly Asn Gly Gly Leu
      20              25              30

Asp Ala Phe Cys Ser Leu Gln Gly Asn Arg Lys Ala Gln Val Phe Asp
      35              40              45

Thr Asp Leu Ile Asp Arg Gln Ile Ala Gln Ile Ser Ala Gly Leu His
      50              55              60

Val Cys Asn Ser Val His Glu Leu Phe Phe Leu Asn Ile His Val Ile
      65              70              75              80

Val Glu Met Cys Ala Trp Tyr Gly Val Ser Ala Gly Glu Tyr Thr Val
      85              90              95

Asn Leu Gln Met Arg Asp Tyr Ile Thr Arg Phe Gln Leu His
      100              105              110
```

<210> 1893

<211> 336

<212> DNA

<213> Neisseria meningitidis

<400> 1893

```
atgttgctcc atcaatgcga caaagcgcgga catatgcgta cccttctgct cggcaggcag 60
gtaaaccgtc atggtcagac gggcaactgt ggactggatg ccttctgcag tttgcagggt 120
aatcggaaaag cgcaggtcct tgataccgac ctgattgata ggcagattgc gcaaattctcg 180
gctggattgc acgtctgcaa tagtggtcat gagttgtttt tccttaatat tcatgtaatt 240
gttgagatgt gtgcatggta tggcgtttcc accggggaat ataccgtcaa tctgcaaatt 300
cgagattata tcaactcgctt ttagcagctg cattga 336
```

<210> 1894

<211> 110

<212> PRT

<213> Neisseria meningitidis

<400> 1894

```
Met Leu Leu His Gln Cys Asp Lys Ala Arg His Met Arg Thr Leu Leu
 1              5              10              15

Leu Gly Arg Gln Val Asn Arg His Gly Gln Thr Gly Asn Cys Gly Leu
      20              25              30

Asp Ala Phe Cys Ser Leu Gln Gly Asn Arg Lys Ala Gln Val Phe Asp
      35              40              45

Thr Asp Leu Ile Asp Arg Gln Ile Ala Gln Ile Ser Ala Gly Leu His
      50              55              60
```

Val Cys Asn Ser Val His Glu Leu Phe Phe Leu Asn Ile His Val Ile
65 70 75 80

Val Glu Met Cys Ala Trp Tyr Gly Val Ser Thr Gly Glu Tyr Thr Val
85 90 95

Asn Leu Gln Met Arg Asp Tyr Ile Thr Arg Phe Gln Leu His
100 105 110

<210> 1895

<211> 1350

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1895

```

atggattccc gcctgcgtgg gaatgacgct aggaaatacg gcatacgctt tgcccaaaga 60
ggccgtctga aacacactcc gcccaacgcc catccttttt cagacggccc cgcacaaaaa 120
aaacaaccac aaactacaag gagaaacatc atgtccgacc aactcattct tgtcctgaac 180
tgcgtcagtt catcgctcaa aggcgcggtt atcgaccgca aaagcggcag cgtcgtccta 240
agctgcctcg gggaacgcct gactacgccc gaagccgcca ttaccttcaa caaagacggc 300
aacaaacgcc aagttccctt gagcggcgcg aactgccacg ccggcgcggg gggtatgctg 360
ttgaacgaac tggaaaaaca cggactgcac gaccgcatca aagccatcgg ccgccgcata 420
gccacaggcg gcgaaaaata tcacgagtcc gtcctcatcg accaagacgt ccttgacgaa 480
ctgaaagcct gcatcccggt cgccccgctg cacaaccccg ccaacatcag cggcatcctc 540
gccgcgcagg aacactttcc cggcctgccc aacgtcggcg tgatggacac ctcgttccac 600
caaaccatgc cggagcgggg ctacacttat gccgtgccgc gcgaattgcg caaaaaatac 660
gccttcgccg gctacgggtt ccacggtacc ggtatgcgtt acgtcgcccc tgaagccgca 720
cgcactcttg gcaaacctct ggaagacatc cgcatagatta ttgccactt aggcaacggc 780
gcatctatta ccgccgtcaa aaacggcaaa tccgtcgata ccggtatggg ttacacgccg 840
atcgaaggtt tgtaaatggg tacacgttgc ggcgacaccg atccggggcg atacagctat 900
ccgactttcc acgcagggat ggatgttgcc caagttagtg aaatgctgaa cgaaaaatca 960
ggtttccccg gtatttcoga acttcccaac gactgccgca cctcgaaat cgccgcccac 1020
gaaggccgcg aaggcgcgcg cctcgccctc gaagtcata cctgccgcct cgccaaatac 1080
atcgcttcga tggctgtggc ctgcggcagt gttgacgcac tcgtgttcac cggcggatat 1140
ggcgaaaact cgcgtaatat ccgtgccaaa accgtttcct atcttgattt cttgggtctg 1200
cacatcgaca ccaaagccaa tatggaaaaa cgctacggca attcgggcat tatcagcccc 1260
accgattctt ctccggctgt tttggctcgc ccgaccaatg aagaactgat gattgcctgc 1320
gacactgccg aacttgccgg catcttgtag                                     1350

```

<210> 1896

<211> 449

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1896

Met Asp Ser Arg Leu Arg Gly Asn Asp Ala Arg Lys Tyr Gly Ile Arg
1 5 10 15

Phe Ala Gln Arg Gly Arg Leu Lys His Thr Pro Pro Asn Ala His Pro
20 25 30

Phe Ser Asp Gly Pro Ala Pro Lys Lys Gln Pro Gln Thr Thr Arg Arg
35 40 45

Asn Ile Met Ser Asp Gln Leu Ile Leu Val Leu Asn Cys Val Ser Ser
 50 55 60

Ser Leu Lys Gly Ala Val Ile Asp Arg Lys Ser Gly Ser Val Val Leu
 65 70 75 80

Ser Cys Leu Gly Glu Arg Leu Thr Thr Pro Glu Ala Val Ile Thr Phe
 85 90 95

Asn Lys Asp Gly Asn Lys Arg Gln Val Pro Leu Ser Gly Arg Asn Cys
 100 105 110

His Ala Gly Ala Val Gly Met Leu Leu Asn Glu Leu Glu Lys His Gly
 115 120 125

Leu His Asp Arg Ile Lys Ala Ile Gly Arg Arg Ile Ala His Gly Gly
 130 135 140

Glu Lys Tyr His Glu Ser Val Leu Ile Asp Gln Asp Val Leu Asp Glu
 145 150 155 160

Leu Lys Ala Cys Ile Pro Phe Ala Pro Leu His Asn Pro Ala Asn Ile
 165 170 175

Ser Gly Ile Leu Ala Ala Gln Glu His Phe Pro Gly Leu Pro Asn Val
 180 185 190

Gly Val Met Asp Thr Ser Phe His Gln Thr Met Pro Glu Arg Ala Tyr
 195 200 205

Thr Tyr Ala Val Pro Arg Glu Leu Arg Lys Lys Tyr Ala Phe Arg Arg
 210 215 220

Tyr Gly Phe His Gly Thr Gly Met Arg Tyr Val Ala Pro Glu Ala Ala
 225 230 235 240

Arg Ile Leu Gly Lys Pro Leu Glu Asp Ile Arg Met Ile Ile Ala His
 245 250 255

Leu Gly Asn Gly Ala Ser Ile Thr Ala Val Lys Asn Gly Lys Ser Val
 260 265 270

Asp Thr Gly Met Gly Phe Thr Pro Ile Glu Gly Leu Val Met Gly Thr
 275 280 285

Arg Cys Gly Asp Thr Asp Pro Gly Val Tyr Ser Tyr Pro Thr Phe His
 290 295 300

Ala Gly Met Asp Val Ala Gln Val Asp Glu Met Leu Asn Glu Lys Ser
 305 310 315 320

Gly Phe Pro Gly Ile Ser Glu Leu Pro Asn Asp Cys Arg Thr Leu Glu
 325 330 335

Ile Ala Ala Asp Glu Gly Arg Glu Gly Ala Arg Leu Ala Leu Glu Val
 340 345 350

Met Thr Cys Arg Leu Ala Lys Tyr Ile Ala Ser Met Ala Val Ala Cys
355 360 365

Gly Ser Val Asp Ala Leu Val Phe Thr Gly Gly Ile Gly Glu Asn Ser
370 375 380

Arg Asn Ile Arg Ala Lys Thr Val Ser Tyr Leu Asp Phe Leu Gly Leu
385 390 395 400

His Ile Asp Thr Lys Ala Asn Met Glu Lys Arg Tyr Gly Asn Ser Gly
405 410 415

Ile Ile Ser Pro Thr Asp Ser Ser Pro Ala Val Leu Val Val Pro Thr
420 425 430

Asn Glu Glu Leu Met Ile Ala Cys Asp Thr Ala Glu Leu Ala Gly Ile
435 440 445

Leu

<210> 1897
<211> 1352
<212> DNA
<213> Neisseria meningitidis

<400> 1897
ctgtcctcgc gtaggcgggg acggaataac gatagaaaat gcggcatacg ctttgcccaa 60
agaggccgtc tgaaacacct tgcgcctgat gtctgccttt ttcagacgac cccacactaa 120
aaaaacaacc acaactaca aggagaaaca tcatgtccga ccaactcatc ctcgttctga 180
actgcggcag ttcacgctc aaaggcgccg ttatcgaccg amaaagcggc agcgctcgtcc 240
taagctgcct cggcgaacgc ctgaccacgc ccgaagccgt cattacgttc aacaaagacg 300
gcaacaaacg ccaagttccc ctgagcggcc gaaattgcca cgccggcgcg gtgggtatgc 360
ttttgaacga actggaaaaa cacggtctgc acgaccgcat caaagccatc ggccaccgca 420
tcgcccacgg cggcgaaaaa tacagcgagt ctgttttgat cgaccaggcc gtaatggacg 480
aactcaatgc ctgcattccg cttgcgcgcg tgcacaaccc cgccaacatc agcggcatcc 540
ttgccgcaca ggaacatttc cccggtctgc ccaatgtcgg cgtgatggat acttcgttcc 600
accaaaccat gccggagcgt gcctacactt atgccgtgcc gcgcgagttg cgtaaaaaat 660
acgctttccg ccgctacggt ttccacggca ccagtatgcg ttacgttgcc cctgaagccg 720
cacgcatctt gggcaaacct ctggaagaca tccgcatgat tattgccac ttaggcaacg 780
gcgcatccat taccgccatc aaaaacggca aatccgtcga taccagtatg ggtttcacgc 840
cgatcgaagg tttggtaatg ggtacacgtt gcggcgacat cgatccgggc gtatacagct 900
atctgacttc ccacgcggg atggatgttg cccaagtga tgaaatgctg aacaaaaaat 960
caggtttgct cggtatattcc gaactttcca acgactgccg caccctcgaa atcgccgccg 1020
acgaaggcca cgaaggcgcg cgcctcgccc tcgaagtcac gacctaccgc ctcgccaaat 1080
acatcgcttc gatggctgtg ggctgcggcg gcgttgacgc actcgtgttc accggcggtg 1140
tcggcgaaaa ctgcgtaaat atccgtgcc aaaccgtttc ctatcttgat ttcttggttc 1200
tgcacatcga caccaaagcc aatatgaaa aacgctacgg caattcgggc attatcagcc 1260
cgaccgattc ttctccggct gttttggttg tcccgaccaa tgaagaactg atgattgcct 1320
gcgacactgc cgaacttgcc ggcatcttgt ag 1352

<210> 1898
<211> 450
<212> PRT

<213> Neisseria meningitidis

<400> 1898

Leu Ser Ser Arg Arg Gly Arg Asn Asn Asp Arg Lys Cys Gly Ile
1 5 10 15
Arg Phe Ala Gln Arg Gly Arg Leu Lys His Leu Ala Pro Asp Val Cys
20 25 30
Xaa Phe Ser Asp Asp Pro Thr Leu Lys Lys Gln Pro Gln Thr Thr Arg
35 40 45
Arg Asn Ile Met Ser Asp Gln Leu Ile Leu Val Leu Asn Cys Gly Ser
50 55 60
Ser Ser Leu Lys Gly Ala Val Ile Asp Arg Xaa Ser Gly Ser Val Val
65 70 75 80
Leu Ser Cys Leu Gly Glu Arg Leu Thr Thr Pro Glu Ala Val Ile Thr
85 90 95
Phe Asn Lys Asp Gly Asn Lys Arg Gln Val Pro Leu Ser Gly Arg Asn
100 105 110
Cys His Ala Gly Ala Val Gly Met Leu Leu Asn Glu Leu Glu Lys His
115 120 125
Gly Leu His Asp Arg Ile Lys Ala Ile Gly His Arg Ile Ala His Gly
130 135 140
Gly Glu Lys Tyr Ser Glu Ser Val Leu Ile Asp Gln Ala Val Met Asp
145 150 155 160
Glu Leu Asn Ala Cys Ile Pro Leu Ala Pro Leu His Asn Pro Ala Asn
165 170 175
Ile Ser Gly Ile Leu Ala Ala Gln Glu His Phe Pro Gly Leu Pro Asn
180 185 190
Val Gly Val Met Asp Thr Ser Phe His Gln Thr Met Pro Glu Arg Ala
195 200 205
Tyr Thr Tyr Ala Val Pro Arg Glu Leu Arg Lys Lys Tyr Ala Phe Arg
210 215 220
Arg Tyr Gly Phe His Gly Thr Ser Met Arg Tyr Val Ala Pro Glu Ala
225 230 235 240
Ala Arg Ile Leu Gly Lys Pro Leu Glu Asp Ile Arg Met Ile Ile Ala
245 250 255
His Leu Gly Asn Gly Ala Ser Ile Thr Ala Ile Lys Asn Gly Lys Ser
260 265 270
Val Asp Thr Ser Met Gly Phe Thr Pro Ile Glu Gly Leu Val Met Gly
275 280 285

Thr Arg Cys Gly Asp Ile Asp Pro Gly Val Tyr Ser Tyr Leu Thr Ser
 290 295 300
 His Ala Gly Met Asp Val Ala Gln Val Asp Glu Met Leu Asn Lys Lys
 305 310 315 320
 Ser Gly Leu Leu Gly Ile Ser Glu Leu Ser Asn Asp Cys Arg Thr Leu
 325 330 335
 Glu Ile Ala Ala Asp Glu Gly His Glu Gly Ala Arg Leu Ala Leu Glu
 340 345 350
 Val Met Thr Tyr Arg Leu Ala Lys Tyr Ile Ala Ser Met Ala Val Gly
 355 360 365
 Cys Gly Gly Val Asp Ala Leu Val Phe Thr Gly Gly Ile Gly Glu Asn
 370 375 380
 Ser Arg Asn Ile Arg Ala Lys Thr Val Ser Tyr Leu Asp Phe Leu Gly
 385 390 395 400
 Leu His Ile Asp Thr Lys Ala Asn Met Glu Lys Arg Tyr Gly Asn Ser
 405 410 415
 Gly Ile Ile Ser Pro Thr Asp Ser Ser Pro Ala Val Leu Val Val Pro
 420 425 430
 Thr Asn Glu Glu Leu Met Ile Ala Cys Asp Thr Ala Glu Leu Ala Gly
 435 440 445
 Ile Leu
 450

<210> 1899
 <211> 1352
 <212> DNA
 <213> Neisseria meningitidis

<400> 1899
 ctgtcctcgc gtaggcgggg acggaataac gatagaaaat gcggcatacg ctttgcccaa 60
 agaggccgctc tgaaacacac tccgccaac gcccatcctt ttccagacga cccacacca 120
 aaaaacaacc acaactaca aggagaaaca tcatgtccga ccaactcatt cttgttctga 180
 actgcggcag ttcatcgctc aaaggtgccg ttatcgaccg caaaagcggc agcgtcgtcc 240
 taagctgcct cggcgaacgc ctgaccacgc ccgaagccgt cattacgttc agcaaagacg 300
 gcaacaaacg ccaagttccc ctgagcggcc ggaactgcca cgcgggcgcg gtgggtatgc 360
 tgttgaacga actggaaaaa cacgaactgc acgaccgcat tcaagccgtc ggccaccgca 420
 tcgcccacgg cggcgaaaaa tacagcgagt ctgttttgat cgaccaggcc gtaatggacg 480
 aactcaatgc ctgcattccg cttgcgcgcg tgcacaaccc cgccaacatc agcggcatcc 540
 tcgcccacga ggaacatttc cccggtctgc ccaatgtcgg cgtgatggat acttcgttcc 600
 accaaaccat gccggagcgt gcctacactt atgccgtgcc gcgcgagttg cgtaaaaaat 660
 acgctttccg ccgctacggt ttccacggca ccagtatgcg ttacgttgcc cctgaagccg 720
 catgcatctt gggcaaacct ctggaagaca tccgcatgat tattgcccac ttaggcaacg 780
 gcgcatccat taccgccatc aaaaacggca aatccgtcga taccagtatg ggtttcacgc 840
 cgatcgaagg tttggtaatg ggtacgcgct gcggcgatat cgaccgggc gtatacagct 900
 atctgacttc acacgccggt ttgatgttg cacaagttga tgaaatgctg aataaaaaat 960
 caggcttgct cggtatattc gaactctcca acgactgccg caccctcgaa atcgccgccg 1020

```

acgaaggcca cgaaggcgcg cgcctcgccc tcgaagttat gacctaccgc ctgcgcaaatt 1080
acatcgcttc gatggctgtg ggctgcggcg gcgttgacgc actcgtgttc accggcggtta 1140
tcggcgaaaa ctgcgtaat atccgtgcca aaaccgtttc ctatcttgat ttcttgggtc 1200
tgcacatcga caccaaagcc aatatggaaa aacgctacgg caattcgggt attatcagcc 1260
cgaccgattc ttctccgget gttttggttg tcccgaacaa tgaagaactg atgattgcct 1320
gcgacactgc cgaacttgtc ggcattctgt ag 1352

```

<210> 1900

<211> 450

<212> PRT

<213> *Neisseria meningitidis*

<400> 1900

```

Leu Ser Ser Arg Arg Gly Arg Asn Asn Asp Arg Lys Cys Gly Ile
 1             5             10             15

```

```

Arg Phe Ala Gln Arg Gly Arg Leu Lys His Thr Pro Pro Asn Ala His
      20             25             30

```

```

Pro Phe Ser Asp Asp Pro Thr Xaa Lys Lys Gln Pro Gln Thr Thr Arg
      35             40             45

```

```

Arg Asn Ile Met Ser Asp Gln Leu Ile Leu Val Leu Asn Cys Gly Ser
      50             55             60

```

```

Ser Ser Leu Lys Gly Ala Val Ile Asp Arg Lys Ser Gly Ser Val Val
      65             70             75             80

```

```

Leu Ser Cys Leu Gly Glu Arg Leu Thr Thr Pro Glu Ala Val Ile Thr
      85             90             95

```

```

Phe Ser Lys Asp Gly Asn Lys Arg Gln Val Pro Leu Ser Gly Arg Asn
     100             105             110

```

```

Cys His Ala Gly Ala Val Gly Met Leu Leu Asn Glu Leu Glu Lys His
     115             120             125

```

```

Glu Leu His Asp Arg Ile Gln Ala Val Gly His Arg Ile Ala His Gly
     130             135             140

```

```

Gly Glu Lys Tyr Ser Glu Ser Val Leu Ile Asp Gln Ala Val Met Asp
     145             150             155             160

```

```

Glu Leu Asn Ala Cys Ile Pro Leu Ala Pro Leu His Asn Pro Ala Asn
     165             170             175

```

```

Ile Ser Gly Ile Leu Ala Ala Gln Glu His Phe Pro Gly Leu Pro Asn
     180             185             190

```

```

Val Gly Val Met Asp Thr Ser Phe His Gln Thr Met Pro Glu Arg Ala
     195             200             205

```

```

Tyr Thr Tyr Ala Val Pro Arg Glu Leu Arg Lys Lys Tyr Ala Phe Arg
     210             215             220

```

```

Arg Tyr Gly Phe His Gly Thr Ser Met Arg Tyr Val Ala Pro Glu Ala

```


225 230 235 240
 Ala Cys Ile Leu Gly Lys Pro Leu Glu Asp Ile Arg Met Ile Ile Ala
 245 250 255
 His Leu Gly Asn Gly Ala Ser Ile Thr Ala Ile Lys Asn Gly Lys Ser
 260 265 270
 Val Asp Thr Ser Met Gly Phe Thr Pro Ile Glu Gly Leu Val Met Gly
 275 280 285
 Thr Arg Cys Gly Asp Ile Asp Pro Gly Val Tyr Ser Tyr Leu Thr Ser
 290 295 300
 His Ala Gly Leu Asp Val Ala Gln Val Asp Glu Met Leu Asn Lys Lys
 305 310 315 320
 Ser Gly Leu Leu Gly Ile Ser Glu Leu Ser Asn Asp Cys Arg Thr Leu
 325 330 335
 Glu Ile Ala Ala Asp Glu Gly His Glu Gly Ala Arg Leu Ala Leu Glu
 340 345 350
 Val Met Thr Tyr Arg Leu Ala Lys Tyr Ile Ala Ser Met Ala Val Gly
 355 360 365
 Cys Gly Gly Val Asp Ala Leu Val Phe Thr Gly Gly Ile Gly Glu Asn
 370 375 380
 Ser Arg Asn Ile Arg Ala Lys Thr Val Ser Tyr Leu Asp Phe Leu Gly
 385 390 395 400
 Leu His Ile Asp Thr Lys Ala Asn Met Glu Lys Arg Tyr Gly Asn Ser
 405 410 415
 Gly Ile Ile Ser Pro Thr Asp Ser Ser Pro Ala Val Leu Val Val Pro
 420 425 430
 Thr Asn Glu Glu Leu Met Ile Ala Cys Asp Thr Ala Glu Leu Val Gly
 435 440 445
 Ile Leu
 450

<210> 1901

<211> 504

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1901

atgccgaag cgcacttctt tacgcgttcc gccgcctgcg gcaaggttga ccagcgtacc 60
 gagcacggcg gcggcgatgg cgaccgaggc gatgcccatc atagcgtggt gcagtttgcc 120
 catgctcagg gcgcgtaccg gcaaactgat gtcggcgcg tttacggttt tgccgctgga 180
 ggcggtgtaa tcggcgggcg gcgcgacgaa ggcggtttc ggcgtgcgc gcggggcggc 240
 ggcttcggat acgtcgctga tcaaaccat tttcagcgcg ccatatgcgc ggatggtttc 300
 aaatttttcc agcgcgggcg catcgttgtt gatgtcgtcc tgcaactctt tgcccgtgta 360

gccccagtcg gcggcggttca ggaaaacggt cggaatgccc gcgttgatga gcgtggcttt 420
cagacgacct atattcgga catcaatttc gtcgacaaa ttgccggttg ggaacatact 480
gccttcgccg tcggctggat ctaa 504

<210> 1902
<211> 167
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1902
Met Pro Glu Ala His Phe Phe Thr Arg Ser Ala Ala Cys Gly Lys Val
1 5 10 15
Asp Gln Arg Thr Glu His Gly Gly Gly Asp Gly Asp Arg Gly Asp Ala
20 25 30
His His Ser Val Val Gln Phe Ala His Ala Gln Gly Ala Tyr Arg Gln
35 40 45
Ile Asp Val Gly Gly Val Tyr Gly Phe Ala Ala Gly Gly Gly Val Ile
50 55 60
Gly Gly Gly Arg Asp Glu Gly Gly Phe Arg Arg Ala Arg Ala Gly Gly
65 70 75 80
Gly Phe Gly Tyr Val Ala Asp Gln Thr His Phe Gln Arg Ala Ile Cys
85 90 95
Ala Asp Gly Phe Lys Phe Phe Gln Arg Gly Gly Ile Val Val Asp Val
100 105 110
Val Leu Gln Leu Phe Ala Arg Val Ala Gln Val Gly Gly Val Gln Glu
115 120 125
Asn Gly Arg Asn Ala Arg Val Asp Glu Arg Gly Phe Gln Thr Thr Tyr
130 135 140
Ile Arg His Ile Asn Phe Val Asp Gln Ile Ala Gly Trp Glu His Thr
145 150 155 160
Ala Phe Ala Val Gly Trp Ile
165

<210> 1903
<211> 507
<212> DNA
<213> Neisseria meningitidis

<400> 1903
atgcccgaag cgcacttctt tacgcgttcc gccgcctgcg gcaagggtga ccagcgtacc 60
gggtacggcg gcggcggtcg caatggcaac agaggcggtg cccatcatcg cgtggtgcag 120
tttgcccatg ctcagggcgc gtaccagcaa atcgatgtcg gcggcggttca cggttttgcc 180
actggaggcg gtgtaatcgg cggcggggcg gacgaaggcg actttcggcg tgtgcgcgcg 240
agcggcagct tcggatacgt cgctgatcag acccattttc agcgcaccgt aagcgcggat 300

tttctcgaat ttttccaaag ccgcggcatc gttgttgatg tcgtcttgca actctttgcc 360
 tgtgtagccc aagtcggcgg cattcaagaa aacggtcgga atgcccgcgt tgatgagcgt 420
 ggctttcaaa cggcctatat tcggcacatc aatttcacgc accaaattgc cggttgggaa 480
 catactgcct tcgccgtcgg ctggatc 507

<210> 1904

<211> 169

<212> PRT

<213> Neisseria meningitidis

<400> 1904

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Pro | Glu | Ala | His | Phe | Phe | Thr | Arg | Ser | Ala | Ala | Cys | Gly | Lys | Val |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Asp | Gln | Arg | Thr | Gly | Tyr | Gly | Gly | Gly | Gly | Arg | Asn | Gly | Asn | Arg | Gly |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Gly | Thr | His | His | Arg | Val | Val | Gln | Phe | Ala | His | Ala | Gln | Gly | Ala | Tyr |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gln | Gln | Ile | Asp | Val | Gly | Gly | Val | His | Gly | Phe | Ala | Thr | Gly | Gly | Gly |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Val | Ile | Gly | Gly | Gly | Arg | Asp | Glu | Gly | Asp | Phe | Arg | Arg | Val | Arg | Ala |
| 65 | | | | | 70 | | | | 75 | | | | | | 80 |
| Ser | Gly | Ser | Phe | Gly | Tyr | Val | Ala | Asp | Gln | Thr | His | Phe | Gln | Arg | Thr |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Val | Ser | Ala | Asp | Phe | Leu | Glu | Phe | Phe | Gln | Ser | Arg | Gly | Ile | Val | Val |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Asp | Val | Val | Leu | Gln | Leu | Phe | Ala | Cys | Val | Ala | Gln | Val | Gly | Gly | Ile |
| | 115 | | | | | 120 | | | | | 125 | | | | |
| Gln | Glu | Asn | Gly | Arg | Asn | Ala | Arg | Val | Asp | Glu | Arg | Gly | Phe | Gln | Thr |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Ala | Tyr | Ile | Arg | His | Ile | Asp | Phe | Ile | Asp | Gln | Ile | Ala | Gly | Trp | Glu |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| His | Thr | Ala | Phe | Ala | Val | Gly | Trp | Ile | | | | | | | |
| | | | | | 165 | | | | | | | | | | |

<210> 1905

<211> 663

<212> DNA

<213> Neisseria meningitidis

<400> 1905

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 gggcacggcg gcggcggtcg caatggcaac agaggcggtg cccatcatcg cgtgggtgcaa 120
 tttgcccatg ctcagggcgc gtaccagcaa atcgatgtcg gcggcattca cggttttgcc 180
 actggaggcg gtgtaatcgg cggcggggcgc gacgaaggcg actttcggcg tgtgcgcgcg 240

```

ggcggcagct tcggatacgt cgctgatcag acccattttc agcgccaccgt aagcgcggtat 300
tttctcgaat ttttccaaag ctgcggcatc gttgttgatg tcgtcttgca actctttgcc 360
cgtgtagccc aagtcggcgg cattcaggaa aacggtcgga atgcccgcgt tgatgagcgt 420
ggctttcaaa cggcctatat tcggcacatc aatttcatcg accaaattgc cggttgggaa 480
catactgcct tcgccgtcgg ctggatcaag aaattcgatt tgtacttcgg ctgccgggaa 540
cgttacgccg tcgagctcaa aatcgcctgt ttccaaaact gcgccgtttt gcatcgggtac 600
atgggcaata atggttttgc cgatgttttt ctgccagatt ttgactgtgc agatgccgtc 660
tga

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<210> 1906

<211> 220

<212> PRT

<213> *Neisseria meningitidis*

<400> 1906

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Met Pro Glu Ala His Phe Phe Thr Arg Ser Ala Ala Cys Gly Lys Val
  1             5             10             15

```

```

Asp Gln Arg Thr Gly His Gly Gly Gly Gly Arg Asn Gly Asn Arg Gly
      20             25             30

```

```

Gly Thr His His Arg Val Val Gln Phe Ala His Ala Gln Gly Ala Tyr
      35             40             45

```

```

Gln Gln Ile Asp Val Gly Gly Ile His Gly Phe Ala Thr Gly Gly Gly
      50             55             60

```

```

Val Ile Gly Gly Gly Arg Asp Glu Gly Asp Phe Arg Arg Val Arg Ala
      65             70             75             80

```

```

Gly Gly Ser Phe Gly Tyr Val Ala Asp Gln Thr His Phe Gln Arg Thr
      85             90             95

```

```

Val Ser Ala Asp Phe Leu Glu Phe Phe Gln Ser Cys Gly Ile Val Val
      100            105            110

```

```

Asp Val Val Leu Gln Leu Phe Ala Arg Val Ala Gln Val Gly Gly Ile
      115            120            125

```

```

Gln Glu Asn Gly Arg Asn Ala Arg Val Asp Glu Arg Gly Phe Gln Thr
      130            135            140

```

```

Ala Tyr Ile Arg His Ile Asn Phe Ile Asp Gln Ile Ala Gly Trp Glu
      145            150            155            160

```

```

His Thr Ala Phe Ala Val Gly Trp Ile Lys Lys Phe Asp Leu Tyr Phe
      165            170            175

```

```

Gly Cys Arg Glu Arg Tyr Ala Val Glu Leu Lys Ile Ala Cys Phe Gln
      180            185            190

```

```

Asn Cys Ala Val Leu His Arg Tyr Met Gly Asn Asn Gly Phe Ala Asp
      195            200            205

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```

Val Phe Leu Pro Asp Phe Asp Cys Ala Asp Ala Val

```

<210> 1907

<211> 1545

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1907

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gaagtacgcg gcgcggtgga tggctgggac tttaaacaat acgttctcgg cacacttttc 120
taccgcttta tcagcgaaaa cttcaccgac tatatgcagg ccggcgacag cagcattgat 180
tacgccgcta tgccggacag catcatcacg cccgaaatca aagacgatgc cgtcaaagtc 240
aaaggctatt tcattctacc cggccagctt ttttgcaata ttgccgccga agcccatcaa 300
aacgaagagc tcaacaccaa gctgaaagaa atctttaccg cgattgaaag ctccgcctcc 360
ggctaccgtt ccgaacaagg catcaaaggc ttgtttgacg acttcgacac caccagcagc 420
cggtcggcga gcaccgttgc cgacaaaaac aaacgccttg ccgccgtcct taaaggcgtg 480
gcggaactcg atttcggcaa ttttgaagac caccgcatcg accttttcgg tgatgcctac 540
gaatacctga tttccaacta cgccgccaac gcaggcaaat ccggcgccga atttttcacc 600
ccgcaaagcg tctccaagct gattgcgcgg ctggcggtgc acgggcagga gaaagtcaac 660
aaaatctacg accccgcctg cggctcgggc agcctgctct tgcaggcgaa aaaacagttt 720
gacgaacaca tcattgaaga aggtctcttc gggcaggaaa tcaaccacac cacctacaac 780
ctcgcccgca tgaatatgtt tctgcacaac gtcaattaca acaaattcca catcgaattg 840
ggcgacacgc tgaccaaccc caaactcaaa gacagcaaac cctttgatgc cgtcgtctcc 900
aatccgccct attccatcga ctggataggc agcgacgacc ccaccttgat caacgacgac 960
cgctttgccc ccgcaggcgt actcgaccg aaatccaaag ccgattttgc cttcatcctg 1020
cacgcactga actacctttc cggcagaggc cgcccgcta tcgtctcatt ccccggcatt 1080
ttctatcgcg gcggcgaga gcagaaaatc cgccaatatc tggaggagg caactatgtg 1140
gaaaccgtga ttgcccttgc gcccaatctc ttttacggca cctgcatcgc cgtcaatatc 1200
ctggttttgt ccaaacacaa agacaatacc gacatccaat tcattcgacg aagcggcttc 1260
tttaaaaaag aaaccaacaa caacgtctta accgaagaac acattgccga aatcgtcaaa 1320
ctcttcgccc acaaagccga tgtgccgat atcgcccaaa acgccgccc gcaaaccgtc 1380
aaagacaacg gctacaacct cgccgtcagc agctatgtcg aagccgaaga caccgcgag 1440
gtcatcgaca tcagacagct caacgccgaa atcagcgaaa ccgtcgccaa aatcgaacgg 1500
ctgcggcgtg aaattgacga agtgattgca gagattgaaa cctag 1545

```

<210> 1908

<211> 514

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1908

```

Met Met Thr Glu Met Gln Gln Arg Ala Gln Leu His Arg Gln Ile Trp
 1             5             10            15

Lys Ile Ala Asp Glu Val Arg Gly Ala Val Asp Gly Trp Asp Phe Lys
      20            25            30

Gln Tyr Val Leu Gly Thr Leu Phe Tyr Arg Phe Ile Ser Glu Asn Phe
      35            40            45

Thr Asp Tyr Met Gln Ala Gly Asp Ser Ser Ile Asp Tyr Ala Ala Met
      50            55            60

Pro Asp Ser Ile Ile Thr Pro Glu Ile Lys Asp Asp Ala Val Lys Val
      65            70            75            80

```

Lys Gly Tyr Phe Ile Tyr Pro Gly Gln Leu Phe Cys Asn Ile Ala Ala
 85 90 95
 Glu Ala His Gln Asn Glu Glu Leu Asn Thr Lys Leu Lys Glu Ile Phe
 100 105 110
 Thr Ala Ile Glu Ser Ser Ala Ser Gly Tyr Pro Ser Glu Gln Gly Ile
 115 120 125
 Lys Gly Leu Phe Asp Asp Phe Asp Thr Thr Ser Ser Arg Leu Gly Ser
 130 135 140
 Thr Val Ala Asp Lys Asn Lys Arg Leu Ala Ala Val Leu Lys Gly Val
 145 150 155 160
 Ala Glu Leu Asp Phe Gly Asn Phe Glu Asp His Arg Ile Asp Leu Phe
 165 170 175
 Gly Asp Ala Tyr Glu Tyr Leu Ile Ser Asn Tyr Ala Ala Asn Ala Gly
 180 185 190
 Lys Ser Gly Gly Glu Phe Phe Thr Pro Gln Ser Val Ser Lys Leu Ile
 195 200 205
 Ala Arg Leu Ala Val His Gly Gln Glu Lys Val Asn Lys Ile Tyr Asp
 210 215 220
 Pro Ala Cys Gly Ser Gly Ser Leu Leu Leu Gln Ala Lys Lys Gln Phe
 225 230 235 240
 Asp Glu His Ile Ile Glu Glu Gly Phe Phe Gly Gln Glu Ile Asn His
 245 250 255
 Thr Thr Tyr Asn Leu Ala Arg Met Asn Met Phe Leu His Asn Val Asn
 260 265 270
 Tyr Asn Lys Phe His Ile Glu Leu Gly Asp Thr Leu Thr Asn Pro Lys
 275 280 285
 Leu Lys Asp Ser Lys Pro Phe Asp Ala Val Val Ser Asn Pro Pro Tyr
 290 295 300
 Ser Ile Asp Trp Ile Gly Ser Asp Asp Pro Thr Leu Ile Asn Asp Asp
 305 310 315 320
 Arg Phe Ala Pro Ala Gly Val Leu Ala Pro Lys Ser Lys Ala Asp Phe
 325 330 335
 Ala Phe Ile Leu His Ala Leu Asn Tyr Leu Ser Gly Arg Gly Arg Ala
 340 345 350
 Ala Ile Val Ser Phe Pro Gly Ile Phe Tyr Arg Gly Gly Ala Glu Gln
 355 360 365
 Lys Ile Arg Gln Tyr Leu Val Glu Gly Asn Tyr Val Glu Thr Val Ile
 370 375 380

Ala Leu Ala Pro Asn Leu Phe Tyr Gly Thr Cys Ile Ala Val Asn Ile
385 390 395 400

Leu Val Leu Ser Lys His Lys Asp Asn Thr Asp Ile Gln Phe Ile Asp
405 410 415

Ala Ser Gly Phe Phe Lys Lys Glu Thr Asn Asn Asn Val Leu Thr Glu
420 425 430

Glu His Ile Ala Glu Ile Val Lys Leu Phe Ala Asp Lys Ala Asp Val
435 440 445

Pro His Ile Ala Gln Asn Ala Ala Gln Gln Thr Val Lys Asp Asn Gly
450 455 460

Tyr Asn Leu Ala Val Ser Ser Tyr Val Glu Ala Glu Asp Thr Arg Glu
465 470 475 480

Val Ile Asp Ile Arg Gln Leu Asn Ala Glu Ile Ser Glu Thr Val Ala
485 490 495

Lys Ile Glu Arg Leu Arg Arg Glu Ile Asp Glu Val Ile Ala Glu Ile
500 505 510

Glu Thr

<210> 1909

<211> 1545

<212> DNA

<213> Neisseria meningitidis

<400> 1909

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taccgcttta tcagcgaaaa cttcaccgac tatatgcagg caggcgacag cagtattgat 180
tacgccgcta tgccggacag catcatcacg cccgaaatca aagacgatgc cgtcaaagtt 240
aaaggctatt tcatctaccc cggccagctt ttttgcaata ttgccgccga agcccatcaa 300
aacgaagagc tcaacaccaa gctgaaagaa atttttaccg cgattgaaaag ctccgcctcc 360
ggctatccgt ccgaacagga catcaaaggc ctgtttgacg acttcgacac caccagcagc 420
cggctcggca gcaactgttc cgacaagaac aaacgccttg ccgccgtcct caaaggcgtg 480
gcggaactcg atttcggcaa ttttgaaaac caccacatcg accttttcgg cgatgcctac 540
gaatacctga tttccaacta cgctgccaac gcaggcaaat ccggcggcga atttttcacc 600
ccgcaaaagc tatccaagct gattgcgcgg ctggcggtgc acggacagga gaaagtcaac 660
aaaatctacg acccagcttg cggtcggggc agtctgctct tgcaggcgaa aaaacagttt 720
gacgagcaca tcatcgaaga aggttcttct gggcaggaaa tcaaccacac cacctacaac 780
ctcgcccgca tgaacatgtt cctgcacaac gtcaattaca accaattcca catcgaattg 840
ggcgacacac tgaccaaccc aaagctcaaa gacagcaaac cctttgatgc catcgtttcc 900
aatccgcctt attccatcaa ctggataggc agcgacgacc ccaccttaat caacgacgac 960
cgctttgccc ccgcaggcgt acttgccccg aaatccaaag ccgattttgc cttcatcctg 1020
cacgcactga actacctttc cggcagaggc cgcgccgcca tcgtctcatt ccccggcatt 1080
ttctatcgcg gcggcgcaga acagaaaatc cgccaatatc tgggtggagg caactacgtg 1140
gaaaccgtga ttgcccttgc gcccaatctc ttttacggca ccggcatcgc cgtcaatatc 1200
ctggttttgt ccaaacacaa agacaatacc gacatccaat tcatcgacgc aagcggcttc 1260
tttaaaaaag aaaccaacaa caacgtctta atcgaagaac acattgctga aatcgtcaaa 1320

ctcttcgccg ataaagccga tgtgcccgc atcgcccaaa acgctgccc gcaaaccgtc 1380
aaagacaacg gctacaacct cgccgtcagc agctatgtcg aagccgaaga cacacgcgaa 1440
attatcgaca tcaaacagct caacgccgaa atcggcgaaa ccgtcgccaa aatcgaacgg 1500
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<210> 1910

<211> 514

<212> PRT

<213> Neisseria meningitidis

<400> 1910

Met Met Thr Glu Met Gln Gln Arg Ala Gln Leu His Arg Gln Ile Trp
1 5 10 15

Lys Ile Ala Asp Glu Val Arg Gly Ala Val Asp Gly Trp Asp Phe Lys
20 25 30

Gln Tyr Val Leu Gly Thr Leu Phe Tyr Arg Phe Ile Ser Glu Asn Phe
35 40 45

Thr Asp Tyr Met Gln Ala Gly Asp Ser Ser Ile Asp Tyr Ala Ala Met
50 55 60

Pro Asp Ser Ile Ile Thr Pro Glu Ile Lys Asp Asp Ala Val Lys Val
65 70 75 80

Lys Gly Tyr Phe Ile Tyr Pro Gly Gln Leu Phe Cys Asn Ile Ala Ala
85 90 95

Glu Ala His Gln Asn Glu Glu Leu Asn Thr Lys Leu Lys Glu Ile Phe
100 105 110

Thr Ala Ile Glu Ser Ser Ala Ser Gly Tyr Pro Ser Glu Gln Asp Ile
115 120 125

Lys Gly Leu Phe Asp Asp Phe Asp Thr Thr Ser Ser Arg Leu Gly Ser
130 135 140

Thr Val Ala Asp Lys Asn Lys Arg Leu Ala Ala Val Leu Lys Gly Val
145 150 155 160

Ala Glu Leu Asp Phe Gly Asn Phe Glu Asn His His Ile Asp Leu Phe
165 170 175

Gly Asp Ala Tyr Glu Tyr Leu Ile Ser Asn Tyr Ala Ala Asn Ala Gly
180 185 190

Lys Ser Gly Gly Glu Phe Phe Thr Pro Gln Ser Val Ser Lys Leu Ile
195 200 205

Ala Arg Leu Ala Val His Gly Gln Glu Lys Val Asn Lys Ile Tyr Asp
210 215 220

Pro Ala Cys Gly Ser Gly Ser Leu Leu Leu Gln Ala Lys Lys Gln Phe
225 230 235 240

Asp Glu His Ile Ile Glu Glu Gly Phe Phe Gly Gln Glu Ile Asn His
 245 250 255
 Thr Thr Tyr Asn Leu Ala Arg Met Asn Met Phe Leu His Asn Val Asn
 260 265 270
 Tyr Asn Gln Phe His Ile Glu Leu Gly Asp Thr Leu Thr Asn Pro Lys
 275 280 285
 Leu Lys Asp Ser Lys Pro Phe Asp Ala Ile Val Ser Asn Pro Pro Tyr
 290 295 300
 Ser Ile Asn Trp Ile Gly Ser Asp Asp Pro Thr Leu Ile Asn Asp Asp
 305 310 315 320
 Arg Phe Ala Pro Ala Gly Val Leu Ala Pro Lys Ser Lys Ala Asp Phe
 325 330 335
 Ala Phe Ile Leu His Ala Leu Asn Tyr Leu Ser Gly Arg Gly Arg Ala
 340 345 350
 Ala Ile Val Ser Phe Pro Gly Ile Phe Tyr Arg Gly Gly Ala Glu Gln
 355 360 365
 Lys Ile Arg Gln Tyr Leu Val Glu Gly Asn Tyr Val Glu Thr Val Ile
 370 375 380
 Ala Leu Ala Pro Asn Leu Phe Tyr Gly Thr Gly Ile Ala Val Asn Ile
 385 390 395 400
 Leu Val Leu Ser Lys His Lys Asp Asn Thr Asp Ile Gln Phe Ile Asp
 405 410 415
 Ala Ser Gly Phe Phe Lys Lys Glu Thr Asn Asn Asn Val Leu Ile Glu
 420 425 430
 Glu His Ile Ala Glu Ile Val Lys Leu Phe Ala Asp Lys Ala Asp Val
 435 440 445
 Pro His Ile Ala Gln Asn Ala Ala Gln Gln Thr Val Lys Asp Asn Gly
 450 455 460
 Tyr Asn Leu Ala Val Ser Ser Tyr Val Glu Ala Glu Asp Thr Arg Glu
 465 470 475 480
 Ile Ile Asp Ile Lys Gln Leu Asn Ala Glu Ile Gly Glu Thr Val Ala
 485 490 495
 Lys Ile Glu Arg Leu Arg Arg Glu Ile Asp Glu Val Ile Ala Glu Ile
 500 505 510
 Glu Ala

<210> 1911

<211> 1545
 <212> DNA
 <213> Neisseria meningitidis

<400> 1911

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gaagtacgcg gcgcggtgga tggctgggac ttcaaacaat acgttctcgg cacacttttc 120
taccgcttta tcagcgaaaa ctttaccgac tatatgcagg caggcgacag cagtattgat 180
tacgccgcta tgccggacag catcatcacg cccgaaatca aagacgatgc cgtcaaagtc 240
aaaggctatt tcatctaccc cggccagctt ttttgcaata ttgccgccga agcccatcaa 300
aacgaagagc tcaacaccaa gctgaaagaa atttttaccg cgattgaaag ctccgcctcc 360
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cggctcggca gcaccgttgc cgacaagaac aaacgccttg ccgccgtcct aaaaggcgtg 480
gcggaactcg atttcggcag ttttgaagac caccacatcg accttttcgg cgatgcctac 540
gaatacctga tttccaacta cgctgccaac gcaggcaaat ccggcggcga atttttcacc 600
ccgcaaagcg tatccaagct gattgcgcgg ctggcgggtgc acgggcagga gaaagtaaac 660
aaaatctacg acccagcttg cggctcgggc agcctgctct tgcaggcgaa aaaacagttt 720
gacgagcaca tcatcgaaga aggcttcttc gggcaggaaa tcaaccacac cacctacaac 780
ctcgcccgca tgaatatgtt tctgcacaaac gtcaattaca acaaattcca catcgaattg 840
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ttctatcgcg gcggcgaga gcagaaaatc cgccaatata tgggtggaggg caactacgtg 1140
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attatcgaca tcaaacagct taacgccgaa atcagcgaaa ccgttgccaa aatcgaacgg 1500
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<210> 1912
 <211> 514
 <212> PRT
 <213> Neisseria meningitidis

<400> 1912

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Met Met Thr Glu Ile Gln Gln Arg Ala Gln Leu His Arg Gln Ile Trp
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Lys Ile Ala Asp Glu Val Arg Gly Ala Val Asp Gly Trp Asp Phe Lys
      20             25             30

Gln Tyr Val Leu Gly Thr Leu Phe Tyr Arg Phe Ile Ser Glu Asn Phe
      35             40             45

Thr Asp Tyr Met Gln Ala Gly Asp Ser Ser Ile Asp Tyr Ala Ala Met
      50             55             60

Pro Asp Ser Ile Ile Thr Pro Glu Ile Lys Asp Asp Ala Val Lys Val
      65             70             75             80

Lys Gly Tyr Phe Ile Tyr Pro Gly Gln Leu Phe Cys Asn Ile Ala Ala
      85             90             95

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Glu Ala His Gln Asn Glu Glu Leu Asn Thr Lys Leu Lys Glu Ile Phe
 100 105 110
 Thr Ala Ile Glu Ser Ser Ala Ser Gly Tyr Pro Ser Glu Gln Asp Ile
 115 120 125
 Lys Gly Leu Phe Asp Asp Phe Asp Thr Thr Ser Ser Arg Leu Gly Ser
 130 135 140
 Thr Val Ala Asp Lys Asn Lys Arg Leu Ala Ala Val Leu Lys Gly Val
 145 150 155 160
 Ala Glu Leu Asp Phe Gly Ser Phe Glu Asp His His Ile Asp Leu Phe
 165 170 175
 Gly Asp Ala Tyr Glu Tyr Leu Ile Ser Asn Tyr Ala Ala Asn Ala Gly
 180 185 190
 Lys Ser Gly Gly Glu Phe Phe Thr Pro Gln Ser Val Ser Lys Leu Ile
 195 200 205
 Ala Arg Leu Ala Val His Gly Gln Glu Lys Val Asn Lys Ile Tyr Asp
 210 215 220
 Pro Ala Cys Gly Ser Gly Ser Leu Leu Leu Gln Ala Lys Lys Gln Phe
 225 230 235 240
 Asp Glu His Ile Ile Glu Glu Gly Phe Phe Gly Gln Glu Ile Asn His
 245 250 255
 Thr Thr Tyr Asn Leu Ala Arg Met Asn Met Phe Leu His Asn Val Asn
 260 265 270
 Tyr Asn Lys Phe His Ile Glu Leu Gly Asp Thr Leu Thr Asn Pro Lys
 275 280 285
 Leu Lys Asp Ser Lys Pro Phe Asp Ala Val Val Ser Asn Pro Pro Tyr
 290 295 300
 Ser Ile Asn Trp Ile Gly Ser Gly Asp Pro Thr Leu Ile Asn Asp Asp
 305 310 315 320
 Arg Phe Ala Pro Ala Gly Val Leu Ala Pro Lys Ser Lys Ala Asp Phe
 325 330 335
 Ala Phe Ile Leu His Ala Leu Asn Tyr Leu Ser Gly Arg Gly Arg Ala
 340 345 350
 Ala Ile Val Ser Phe Pro Gly Ile Phe Tyr Arg Gly Gly Ala Glu Gln
 355 360 365
 Lys Ile Arg Gln Tyr Leu Val Glu Gly Asn Tyr Val Glu Thr Val Ile
 370 375 380
 Ala Leu Ala Pro Asn Leu Phe Tyr Gly Thr Gly Ile Ala Val Asn Ile
 385 390 395 400

Leu Val Leu Ser Lys His Lys Asp Asn Thr Asp Ile Gln Phe Ile Asp
 405 410 415
 Ala Gly Gly Phe Phe Lys Lys Glu Thr Asn Asn Asn Val Leu Thr Glu
 420 425 430
 Glu His Ile Ala Glu Ile Val Lys Leu Phe Ala Asp Lys Ala Asp Val
 435 440 445
 Pro His Ile Ala Gln Asn Ala Ala Gln Gln Thr Val Lys Asp Asn Gly
 450 455 460
 Tyr Asn Leu Ala Val Ser Ser Tyr Val Glu Pro Glu Asp Thr Arg Glu
 465 470 475 480
 Ile Ile Asp Ile Lys Gln Leu Asn Ala Glu Ile Ser Glu Thr Val Ala
 485 490 495
 Lys Ile Glu Arg Leu Arg Arg Glu Ile Asp Glu Val Ile Ala Glu Ile
 500 505 510
 Glu Ala

<210> 1913
 <211> 681
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1913
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 acgccagaag tcgccatcta ccaactcccc gaacccaatg cctttgccac gggcgcatcg 180
 agaaacagct ccctgatcgc cgtcagcacc ggtttgctcg accatatgac gcgcgacgaa 240
 gtggaagccg tgttggcgca cgaaatggcg cacgtcgga acggcgacat ggttacgctg 300
 acgctgattc aaggcgtggt caataccttt gtcgtgttcc tgcgcgcat tattgccaac 360
 ctgattgccc gaaacaacga cggcagccag tcccaggga cttatttcct agtcagcatg 420
 gtattccaaa tcctgttcgg cttccttgcc agcctgattg tcatgtggtt cagccgcaa 480
 cgcaataacc gcgcgacgc gggcgcgga aaactggcg gcgcaccgaa aatgatttcc 540
 gccctgcaa ggcttaaagg caaccgggtc gatttgccc aagaaatgaa cgcaatgggc 600
 atcgccggag atacgcgcga ctccctgctc agcaccacc cttcgctgga caaccgaatc 660
 gccgcctca aatcgcttta a 681

<210> 1914
 <211> 226
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1914
 Met Ser Lys Phe Ile Ala Lys Gln Ser Val Gly Ala Glu Val Ile Asp
 1 5 10 15
 Thr Pro Arg Thr Glu Glu Glu Ala Trp Leu Leu Asn Thr Val Glu Ala
 20 25 30

| | | | | | | | |
|-------------|------------|------------|------------|-------------|--------------|-----|--|
| <400> | 1915 | | | | | | |
| atgtccaaat | ttatcgccaa | acaatcggtc | ggcgcggaag | ttatcgacac | gccgcgcacc | 60 | |
| gaagaagaag | cctggctttt | gaacactgtc | gaagcccaag | cgcggcgaatg | gaacctgaaa | 120 | |
| acgcccgaag | tcgccatcta | ccactcccc | gaacccaatg | cctttgccac | gggcgcacatcg | 180 | |
| agaaacagct | ccctgatcgc | cgtcagcacc | ggtttgctcg | accatatgac | gcgtgacgaa | 240 | |
| gtggaagccg | tattggcgca | cgaaatggca | cacgtcgga | acggcgatat | ggttacgctg | 300 | |
| acgctgattc | aaggcgtggt | caataccttt | gtcgtgttcc | tgtcgcgcac | tattgccaac | 360 | |
| ctgattgccc | gaaacaacga | cggcagccag | tcccaggga | cttatttct | ggtcagcatg | 420 | |
| gtattccaaa | tctctgttcg | cttccttgcc | agcttaattg | tcattgtggt | cagccgacaa | 480 | |
| cgcgcaatacc | gcgcgatgc | gggcgcggca | aaactggctg | gcgcgcgga | aatgatttcc | 540 | |
| gcctcgaaa | ggctcaaagc | caaccgcgtc | gatttgcccg | aagaaatgaa | cgcaatgggc | 600 | |
| atcgccggag | gtacgcgcga | ctccctgtct | agcaaccacc | cttcgctgga | caaccgtatc | 660 | |

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681

<210> 1916

<211> 226

<212> PRT

<213> Neisseria meningitidis

<400> 1916

Met Ser Lys Phe Ile Ala Lys Gln Ser Val Gly Ala Glu Val Ile Asp
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Thr Pro Arg Thr Glu Glu Glu Ala Trp Leu Leu Asn Thr Val Glu Ala
20 25 30

Gln Ala Arg Gln Trp Asn Leu Lys Thr Pro Glu Val Ala Ile Tyr His
35 40 45

Ser Pro Glu Pro Asn Ala Phe Ala Thr Gly Ala Ser Arg Asn Ser Ser
50 55 60

Leu Ile Ala Val Ser Thr Gly Leu Leu Asp His Met Thr Arg Asp Glu
65 70 75 80

Val Glu Ala Val Leu Ala His Glu Met Ala His Val Gly Asn Gly Asp
85 90 95

Met Val Thr Leu Thr Leu Ile Gln Gly Val Val Asn Thr Phe Val Val
100 105 110

Phe Leu Ser Arg Ile Ile Ala Asn Leu Ile Ala Arg Asn Asn Asp Gly
115 120 125

Ser Gln Ser Gln Gly Thr Tyr Phe Leu Val Ser Met Val Phe Gln Ile
130 135 140

Leu Phe Gly Phe Leu Ala Ser Leu Ile Val Met Trp Phe Ser Arg Gln
145 150 155 160

Arg Glu Tyr Arg Ala Asp Ala Gly Ala Ala Lys Leu Val Gly Ala Pro
165 170 175

Lys Met Ile Ser Ala Leu Gln Arg Leu Lys Gly Asn Pro Val Asp Leu
180 185 190

Pro Glu Glu Met Asn Ala Met Gly Ile Ala Gly Asp Thr Arg Asp Ser
195 200 205

Leu Leu Ser Thr His Pro Ser Leu Asp Asn Arg Ile Ala Arg Leu Lys
210 215 220

Ser Leu
225

<210> 1917

<211> 681

<212> DNA

<213> Neisseria meningitidis

<400> 1917

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acgcccgaag tcgccatcta ccactcccc gaaccaatg cctttgccac gggcgcatcg 180
agaaacagct ccctgatcgc cgtcagcacc ggtttgctcg accatatgac gcgtgacgaa 240
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ctgattgccc gaaacaacga cggcagccag tcccaggga cttatttcct ggtcagcatg 420
gtattccaaa tcctgttcgg ctteettgcc agcttaattg tcatgtggtt cagccgacaa 480
cgcaataacc gcgcgcgacgc gggcgcgga aaactggtcg gcgcgccgaa aatgatttcc 540
gccctgcaaa ggcttaaagg caaccgggtc gatttgcccc aagaaatgaa cgcaatgggc 600
atcgccggag atacgcgcga ctccctgctc agcaccacc cttcgctgga caaccgaatc 660
gcccgctca aatcgcttta a                                     681
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<210> 1918

<211> 226

<212> PRT

<213> Neisseria meningitidis

<400> 1918

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Gln Ala Arg Gln Trp Asn Leu Lys Thr Pro Glu Val Ala Ile Tyr His
      35             40             45

Ser Pro Glu Pro Asn Ala Phe Ala Thr Gly Ala Ser Arg Asn Ser Ser
      50             55             60

Leu Ile Ala Val Ser Thr Gly Leu Leu Asp His Met Thr Arg Asp Glu
      65             70             75             80

Val Glu Ala Val Leu Ala His Glu Met Ala His Val Gly Asn Gly Asp
      85             90             95

Met Val Thr Leu Thr Leu Ile Gln Gly Val Val Asn Thr Phe Val Val
      100            105            110

Phe Leu Ser Arg Ile Ile Ala Asn Leu Ile Ala Arg Asn Asn Asp Gly
      115            120            125

Ser Gln Ser Gln Gly Thr Tyr Phe Leu Val Ser Met Val Phe Gln Ile
      130            135            140

Leu Phe Gly Phe Leu Ala Ser Leu Ile Val Met Trp Phe Ser Arg Gln
      145            150            155            160

Arg Glu Tyr Arg Ala Asp Ala Gly Ala Ala Lys Leu Val Gly Ala Pro
      165            170            175
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Lys Met Ile Ser Ala Leu Gln Arg Leu Lys Gly Asn Pro Val Asp Leu
180 185 190

Pro Glu Glu Met Asn Ala Met Gly Ile Ala Gly Asp Thr Arg Asp Ser
195 200 205

Leu Leu Ser Thr His Pro Ser Leu Asp Asn Arg Ile Ala Arg Leu Lys
210 215 220

Ser Leu
225

<210> 1919

<211> 1380

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1919

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gataccgtga tggcgggcgg tgcgggcaag gaagatttgg cggcgggtggc tttgggcagc 180
agcgcgtttg ccacgggtta tattaccttt atgggcatta tggcggcgct gaaccgcgatg 240
attgccacgc tttacggcgc gggtaaaacc ggtgaagcag gcgaaacggg gcggcagggg 300
atttggttcg ggctgatttt ggggattttc ggcatgattt tgatgtgggc ggcgattacg 360
ccgttccgca actggctgac tttgagcgat tatgtggaag gcacaatggc gcagtatatg 420
ctgttcacca gcttggcgat gccggcgga atggtacacc gcgactgca cgcctacgct 480
tccagcctga accgcccgcg cctgattatg ttggtcagct ttgcggcggt tgtgttgaac 540
gtgccgctga actatatatt cgtttacggc aaattcggta tgcccgcgtt ggggtggcga 600
gggtgcggcg tggcgacaat ggcggtgttt tgggtcagcg cgctggcatt gtggatttat 660
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gaagccagcg cgttttcggt tatcgtgttt ttgattgcgc ctttcggcga ggattatgtg 840
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ggctcggcag ggacgggtgc catcggtctt tcgcttgggc ggcgcgaatt ttcgcgggcg 960
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<210> 1920

<211> 459

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1920

Met Leu Leu Asp Leu Asp Arg Phe Ser Phe Ser Val Phe Leu Lys Glu
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Ala Gln Val Gly Ile Gly Phe Val Asp Thr Val Met Ala Gly Gly Ala
 35 40 45
 Gly Lys Glu Asp Leu Ala Ala Val Ala Leu Gly Ser Ser Ala Phe Ala
 50 55 60
 Thr Val Tyr Ile Thr Phe Met Gly Ile Met Ala Ala Leu Asn Pro Met
 65 70 75 80
 Ile Ala Gln Leu Tyr Gly Ala Gly Lys Thr Gly Glu Ala Gly Glu Thr
 85 90 95
 Gly Arg Gln Gly Ile Trp Phe Gly Leu Ile Leu Gly Ile Phe Gly Met
 100 105 110
 Ile Leu Met Trp Ala Ala Ile Thr Pro Phe Arg Asn Trp Leu Thr Leu
 115 120 125
 Ser Asp Tyr Val Glu Gly Thr Met Ala Gln Tyr Met Leu Phe Thr Ser
 130 135 140
 Leu Ala Met Pro Ala Ala Met Val His Arg Ala Leu His Ala Tyr Ala
 145 150 155 160
 Ser Ser Leu Asn Arg Pro Arg Leu Ile Met Leu Val Ser Phe Ala Ala
 165 170 175
 Phe Val Leu Asn Val Pro Leu Asn Tyr Ile Phe Val Tyr Gly Lys Phe
 180 185 190
 Gly Met Pro Ala Leu Gly Gly Ala Gly Cys Gly Val Ala Thr Met Ala
 195 200 205
 Val Phe Trp Phe Ser Ala Leu Ala Leu Trp Ile Tyr Ile Ala Lys Glu
 210 215 220
 Lys Phe Phe Arg Pro Phe Gly Leu Thr Ala Lys Phe Gly Lys Pro Asp
 225 230 235 240
 Trp Ala Val Phe Lys Gln Ile Trp Lys Ile Gly Ala Pro Ile Gly Leu
 245 250 255
 Ser Tyr Phe Leu Glu Ala Ser Ala Phe Ser Phe Ile Val Phe Leu Ile
 260 265 270
 Ala Pro Phe Gly Glu Asp Tyr Val Ala Ala Gln Gln Val Gly Ile Ser
 275 280 285
 Leu Ser Gly Ile Leu Tyr Met Ile Pro Gln Ser Val Gly Ser Ala Gly
 290 295 300
 Thr Val Arg Ile Gly Phe Ser Leu Gly Arg Arg Glu Phe Ser Arg Ala
 305 310 315 320
 Arg Tyr Ile Ser Gly Val Ser Leu Val Ser Gly Trp Val Leu Ala Val
 325 330 335

Ile Thr Val Leu Ser Leu Val Leu Phe Arg Ser Pro Leu Ala Ser Met
340 345 350

Tyr Asn Asp Asp Pro Ala Val Leu Ser Ile Ala Ser Thr Val Leu Leu
355 360 365

Phe Ala Gly Leu Phe Gln Pro Ala Asp Phe Thr Gln Cys Ile Ala Ser
370 375 380

Tyr Ala Leu Arg Gly Tyr Lys Val Thr Lys Val Pro Met Phe Ile His
385 390 395 400

Ala Ala Ala Phe Trp Gly Cys Gly Leu Leu Pro Gly Tyr Leu Leu Ala
405 410 415

Tyr Arg Phe Asp Met Gly Ile Tyr Gly Phe Trp Thr Ala Leu Ile Ala
420 425 430

Ser Leu Thr Ile Ala Ala Val Ala Leu Val Trp Cys Leu Glu Lys Tyr
435 440 445

Ser Met Glu Leu Val Lys Ser His Lys Ala Val
450 455

<210> 1921

<211> 1380

<212> DNA

<213> Neisseria meningitidis

<400> 1921

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gatactgtga tggcggggcg tgcgggcaag gaagacttgg cggcgggtggc tttgggcagc 180
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agcatcgccg ccaccgtctt actgttcgcc ggcttgttcc aaccggcaga cttcacccaa 1140
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<210> 1922
 <211> 459
 <212> PRT
 <213> Neisseria meningitidis

<400> 1922

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| Met | Leu | Leu | Asp | Leu | Asn | Arg | Phe | Ser | Phe | Pro | Val | Phe | Leu | Lys | Glu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Val | Arg | Leu | Leu | Thr | Thr | Leu | Ala | Leu | Pro | Met | Leu | Leu | Ala | Gln | Val |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Ala | Gln | Val | Gly | Ile | Gly | Phe | Val | Asp | Thr | Val | Met | Ala | Gly | Gly | Ala |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gly | Lys | Glu | Asp | Leu | Ala | Ala | Val | Ala | Leu | Gly | Ser | Ser | Ala | Phe | Ala |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Thr | Val | Tyr | Ile | Thr | Phe | Met | Gly | Ile | Met | Ala | Ala | Leu | Asn | Pro | Met |
| | 65 | | | | 70 | | | | | 75 | | | | 80 | |
| Ile | Ala | Gln | Leu | Tyr | Gly | Ala | Gly | Lys | Thr | Asp | Glu | Val | Gly | Glu | Thr |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Gly | Arg | Gln | Gly | Ile | Trp | Phe | Gly | Leu | Phe | Leu | Gly | Val | Phe | Gly | Met |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Val | Leu | Met | Trp | Ala | Ala | Ile | Thr | Pro | Phe | Arg | Asn | Trp | Leu | Thr | Leu |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ser | Asp | Tyr | Val | Glu | Gly | Thr | Met | Ala | Gln | Tyr | Met | Leu | Phe | Thr | Ser |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Leu | Ala | Met | Pro | Ala | Ala | Met | Val | His | Arg | Ala | Leu | His | Ala | Tyr | Thr |
| | 145 | | | | 150 | | | | | 155 | | | | 160 | |
| Ser | Ser | Leu | Asn | Arg | Pro | Arg | Leu | Ile | Met | Leu | Val | Ser | Phe | Ala | Ala |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Phe | Val | Leu | Asn | Val | Pro | Leu | Asn | Tyr | Ile | Phe | Val | Tyr | Gly | Lys | Phe |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Gly | Met | Pro | Ala | Leu | Gly | Gly | Ala | Gly | Cys | Gly | Leu | Ala | Thr | Met | Ala |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Val | Phe | Trp | Phe | Ser | Ala | Leu | Ala | Leu | Trp | Ile | Tyr | Ile | Ala | Lys | Glu |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Asn | Phe | Phe | Arg | Pro | Phe | Gly | Leu | Thr | Ala | Lys | Phe | Gly | Lys | Pro | Asp |
| | 225 | | | | 230 | | | | | 235 | | | | 240 | |
| Trp | Ala | Val | Phe | Lys | Gln | Ile | Trp | Lys | Ile | Gly | Ala | Pro | Ile | Gly | Leu |
| | | | 245 | | | | | | 250 | | | | | 255 | |
| Ser | Tyr | Phe | Leu | Glu | Ala | Ser | Ala | Phe | Ser | Phe | Ile | Val | Phe | Leu | Ile |
| | | | 260 | | | | | 265 | | | | | 270 | | |

Ala Pro Phe Gly Glu Asp Tyr Val Ala Ala Gln Gln Val Gly Ile Ser
 275 280 285
 Leu Ser Gly Ile Leu Tyr Met Ile Pro Gln Ser Val Gly Ser Ala Gly
 290 295 300
 Thr Val Arg Ile Gly Phe Ser Leu Gly Arg Arg Glu Phe Ser Arg Ala
 305 310 315 320
 Arg Tyr Ile Ser Gly Val Ser Leu Val Leu Gly Trp Met Leu Ala Val
 325 330 335
 Ile Thr Val Leu Ser Leu Val Leu Phe Arg Ser Pro Leu Val Ser Met
 340 345 350
 Tyr Asn Asn Asp Pro Ala Val Leu Ser Ile Ala Ala Thr Val Leu Leu
 355 360 365
 Phe Ala Gly Leu Phe Gln Pro Ala Asp Phe Thr Gln Cys Ile Ala Ser
 370 375 380
 Tyr Ala Leu Arg Gly Tyr Lys Val Thr Lys Val Pro Met Phe Ile His
 385 390 395 400
 Ala Ala Ala Phe Trp Gly Cys Gly Leu Leu Pro Gly Tyr Leu Leu Ala
 405 410 415
 Tyr Arg Phe Asn Met Gly Ile Tyr Gly Phe Trp Thr Ala Leu Ile Ala
 420 425 430
 Ser Leu Thr Ile Ala Ala Ile Ala Leu Val Trp Cys Leu Glu Leu Cys
 435 440 445
 Ser Arg Glu Met Val Arg Ser His Lys Ala Val
 450 455

<210> 1923

<211> 1380

<212> DNA

<213> *Neisseria meningitidis*

<400> 1923

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<210> 1924

<211> 459

<212> PRT

<213> *Neisseria meningitidis*

<400> 1924

| | | | | | | | | | | | | | | | | | | | |
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| Met | Leu | Leu | Asp | Leu | Asn | Arg | Phe | Ser | Phe | Ser | Val | Phe | Leu | Lys | Glu | 1 | 5 | 10 | 15 |
| Val | Arg | Leu | Leu | Thr | Ala | Leu | Ala | Leu | Pro | Met | Leu | Leu | Ala | Gln | Val | 20 | 25 | 30 | |
| Ala | Gln | Val | Gly | Ile | Gly | Phe | Val | Asp | Thr | Val | Met | Ala | Gly | Gly | Ala | 35 | 40 | 45 | |
| Gly | Lys | Glu | Asp | Leu | Ala | Ala | Val | Ala | Leu | Gly | Ser | Ser | Ala | Phe | Ala | 50 | 55 | 60 | |
| Thr | Val | Tyr | Ile | Thr | Phe | Met | Gly | Ile | Met | Ala | Ala | Leu | Asn | Pro | Met | 65 | 70 | 75 | 80 |
| Ile | Ala | Gln | Leu | Tyr | Gly | Ala | Gly | Lys | Thr | Asp | Glu | Val | Gly | Glu | Thr | 85 | 90 | 95 | |
| Gly | Arg | Gln | Gly | Ile | Trp | Phe | Gly | Leu | Phe | Leu | Gly | Val | Phe | Gly | Met | 100 | 105 | 110 | |
| Val | Leu | Met | Trp | Ala | Ala | Ile | Thr | Pro | Phe | Arg | Asn | Trp | Leu | Thr | Leu | 115 | 120 | 125 | |
| Ser | Asp | Tyr | Val | Glu | Gly | Thr | Met | Ala | Gln | Tyr | Met | Leu | Phe | Thr | Ser | 130 | 135 | 140 | |
| Leu | Ala | Met | Pro | Ala | Ala | Met | Val | His | Arg | Ala | Leu | His | Ala | Tyr | Ala | 145 | 150 | 155 | 160 |
| Ser | Ser | Leu | Asn | Arg | Pro | Arg | Leu | Ile | Met | Leu | Val | Ser | Phe | Ala | Ala | 165 | 170 | 175 | |
| Phe | Val | Leu | Asn | Val | Pro | Leu | Asn | Tyr | Ile | Phe | Val | Tyr | Gly | Lys | Phe | 180 | 185 | 190 | |
| Gly | Met | Pro | Ala | Leu | Gly | Gly | Ala | Gly | Cys | Gly | Leu | Ala | Thr | Met | Ala | 195 | 200 | 205 | |
| Val | Phe | Trp | Phe | Ser | Ala | Leu | Ala | Leu | Trp | Ile | Tyr | Ile | Ala | Lys | Glu | | | | |

| 210 | 215 | 220 |
|--|-----|-----|
| Asn Phe Phe Arg Pro Phe Gly Leu Thr Ala Lys Phe Gly Lys Pro Asp 225 230 235 240 | | |
| Trp Ala Val Phe Lys Gln Ile Trp Lys Ile Gly Ala Pro Ile Gly Leu 245 250 255 | | |
| Ser Tyr Phe Leu Glu Ala Ser Ala Phe Ser Phe Ile Val Phe Leu Ile 260 265 270 | | |
| Ala Pro Phe Gly Glu Asp Tyr Val Ala Ala Gln Gln Val Gly Ile Ser 275 280 285 | | |
| Leu Ser Gly Ile Leu Tyr Met Ile Pro Gln Ser Val Gly Ser Ala Gly 290 295 300 | | |
| Thr Val Arg Ile Gly Phe Ser Leu Gly Arg Arg Glu Phe Ser Arg Ala 305 310 315 320 | | |
| Arg Tyr Ile Ser Gly Val Ser Leu Val Ser Gly Trp Met Leu Ala Val 325 330 335 | | |
| Ile Thr Val Leu Ser Leu Val Leu Phe Arg Ser Pro Leu Val Ser Met 340 345 350 | | |
| Tyr Asn Asn Asp Pro Ala Val Leu Ser Ile Ala Ala Thr Val Leu Leu 355 360 365 | | |
| Phe Ala Gly Leu Phe Gln Pro Ala Asp Phe Thr Gln Cys Ile Ala Ser 370 375 380 | | |
| Tyr Ala Leu Arg Gly Tyr Lys Val Thr Lys Val Pro Met Phe Ile His 385 390 395 400 | | |
| Ala Ala Ala Phe Trp Gly Cys Gly Leu Leu Pro Gly Tyr Leu Leu Ala 405 410 415 | | |
| Tyr Arg Phe Asp Met Gly Ile Tyr Gly Phe Trp Thr Ala Leu Ile Ala 420 425 430 | | |
| Ser Leu Thr Ile Ala Ala Ile Ala Leu Val Trp Cys Leu Glu Leu Cys 435 440 445 | | |
| Ser Arg Glu Met Val Arg Ser His Lys Ala Val 450 455 | | |

<210> 1925

<211> 567

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1925

atgtccgccc tcctcccat catcaaccgc ctgattctgc aaagcccgga cagccgctcg 60
gaacttacct cctttgcagg caaaacactg accctgaaca ttgccgggct gaaactggcg 120
ggacgcata cagaagacgg tttgctctcg gcgggaaacg gctttgcaga caccgaaatt 180

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accttccgca acagcgcgat acggaaaatc ctccaaggcg gcgaacccgg ggctggcgac 240
atcaggctcg aaggcgacct catcctcggc atcgcggtac tgtccctgct cggcagcctg 300
cgttcccgcg catcggacga attggcacgg attttcggca cgcaggcagg catcggcagc 360
cgtgccaccg acatcggaca cggcatcaaa caaatcggca ggaacatcgc cgaacaaatc 420
ggcggatttt cccgcgaacc cgagtccgca aacaccggca acgaagccct tgccgactgc 480
ctcgacgaaa taagcagact gcgcgacggc gtggaacgcc tcaacgaacg cctcgacagg 540
ctcgaacgcg acatttgat agactaa 567

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<210> 1926

<211> 188

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 1926

```

Met Ser Ala Leu Leu Pro Ile Ile Asn Arg Leu Ile Leu Gln Ser Pro
 1           5           10           15
Asp Ser Arg Ser Glu Leu Thr Ser Phe Ala Gly Lys Thr Leu Thr Leu
20           25           30
Asn Ile Ala Gly Leu Lys Leu Ala Gly Arg Ile Thr Glu Asp Gly Leu
35           40           45
Leu Ser Ala Gly Asn Gly Phe Ala Asp Thr Glu Ile Thr Phe Arg Asn
50           55           60
Ser Ala Ile Arg Lys Ile Leu Gln Gly Gly Glu Pro Gly Ala Gly Asp
65           70           75           80
Ile Arg Leu Glu Gly Asp Leu Ile Leu Gly Ile Ala Val Leu Ser Leu
85           90           95
Leu Gly Ser Leu Arg Ser Arg Ala Ser Asp Glu Leu Ala Arg Ile Phe
100          105          110
Gly Thr Gln Ala Gly Ile Gly Ser Arg Ala Thr Asp Ile Gly His Gly
115          120          125
Ile Lys Gln Ile Gly Arg Asn Ile Ala Glu Gln Ile Gly Gly Phe Ser
130          135          140
Arg Glu Pro Glu Ser Ala Asn Thr Gly Asn Glu Ala Leu Ala Asp Cys
145          150          155          160
Leu Asp Glu Ile Ser Arg Leu Arg Asp Gly Val Glu Arg Leu Asn Glu
165          170          175
Arg Leu Asp Arg Leu Glu Arg Asp Ile Trp Ile Asp
180          185

```

<210> 1927

<211> 567

<212> DNA

<213> *Neisseria meningitidis*

<400> 1927

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atgtccgccc tcttccccat catcaaccgc ctgattctgc aaagcccgga cagccgctcg 60
gaacttgccg cctttgcagg caaaacactg accctgaaca ttgccgggct gaaactggcg 120
ggacgcatca cggaagacgg ttgtctctcg gcgggaaacg gctttgcaga caccgaaatt 180
accttccgca acagcgcggt acagaaaatc ctccaaggag gcgaaccggg ggcgggcgac 240
atcgggctcg aaggcgacct catcctcggc atcgcggtac tgtccctgct cggcagcctg 300
cgttcccgcg catcggacga attggcacgg attttcggca cgcaggcaga catcggcagc 360
cgtgccgcgg acatcggaca cggcatcaaa caaatcggca ggaacatcgc cgaacaaatc 420
ggcggtatatt cccgcgaatc cgagtccgca aacatcggca acgaagccct tgccgactgc 480
ctcgacgaaa taagcagact gcgcgacggc gtggaacgcc tcaacgaacg cctcgaccgg 540
ctcgaacgcg acatttggat agactaa 567
```

<210> 1928

<211> 188

<212> PRT

<213> *Neisseria meningitidis*

<400> 1928

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Met Ser Ala Leu Leu Pro Ile Ile Asn Arg Leu Ile Leu Gln Ser Pro
  1             5             10             15

Asp Ser Arg Ser Glu Leu Ala Ala Phe Ala Gly Lys Thr Leu Thr Leu
      20             25             30

Asn Ile Ala Gly Leu Lys Leu Ala Gly Arg Ile Thr Glu Asp Gly Leu
      35             40             45

Leu Ser Ala Gly Asn Gly Phe Ala Asp Thr Glu Ile Thr Phe Arg Asn
      50             55             60

Ser Ala Val Gln Lys Ile Leu Gln Gly Gly Glu Pro Gly Ala Gly Asp
      65             70             75             80

Ile Gly Leu Glu Gly Asp Leu Ile Leu Gly Ile Ala Val Leu Ser Leu
      85             90             95

Leu Gly Ser Leu Arg Ser Arg Ala Ser Asp Glu Leu Ala Arg Ile Phe
      100            105            110

Gly Thr Gln Ala Asp Ile Gly Ser Arg Ala Ala Asp Ile Gly His Gly
      115            120            125

Ile Lys Gln Ile Gly Arg Asn Ile Ala Glu Gln Ile Gly Gly Phe Ser
      130            135            140

Arg Glu Ser Glu Ser Ala Asn Ile Gly Asn Glu Ala Leu Ala Asp Cys
      145            150            155            160

Leu Asp Glu Ile Ser Arg Leu Arg Asp Gly Val Glu Arg Leu Asn Glu
      165            170            175

Arg Leu Asp Arg Leu Glu Arg Asp Ile Trp Ile Asp
      180            185
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<210> 1929

<211> 567
<212> DNA
<213> Neisseria meningitidis

<400> 1929
atgtccgccc tcttccccat catcaaccgc ctgattctgc aaagcccgga cagccgctcg 60
gaacttgccg ccttcgcagg caaaacactg accctgaaca ttgccgggtt gaaactggcg 120
ggacgcatca cggaagacgg tttgctctcg gcgggaaacg gctttgcaga caccgaaatc 180
accttcgcga acagcgcggt acagaaaatc ctccaaggcg gcgaaccggg ggcgggcgac 240
atcgggctcg aaggcgacct catcctcggc atcgcggtac tgtccctgct cggcagcctg 300
cgttcccgcg catcggacga attggcacgg attttcggca cgcaggcaga catcggcagc 360
cgtgccgccc acatcggaca cggcatcaaa caaatcggca ggaacatcgc cgaacaaatc 420
ggcagatttt cccgcgaacc cgagtcgcga aacatcggca acgaagccct tgccgactgc 480
ctcgacgaaa taagcagact gcgcgacggc gtggaacgcc tcaacgaacg cctcgaccgg 540
ctcgaacgcg acatttgat agactaa 567

<210> 1930
<211> 188
<212> PRT
<213> Neisseria meningitidis

<400> 1930
Met Ser Ala Leu Leu Pro Ile Ile Asn Arg Leu Ile Leu Gln Ser Pro
1 5 10 15
Asp Ser Arg Ser Glu Leu Ala Ala Phe Ala Gly Lys Thr Leu Thr Leu
20 25 30
Asn Ile Ala Gly Leu Lys Leu Ala Gly Arg Ile Thr Glu Asp Gly Leu
35 40 45
Leu Ser Ala Gly Asn Gly Phe Ala Asp Thr Glu Ile Thr Phe Arg Asn
50 55 60
Ser Ala Val Gln Lys Ile Leu Gln Gly Gly Glu Pro Gly Ala Gly Asp
65 70 75 80
Ile Gly Leu Glu Gly Asp Leu Ile Leu Gly Ile Ala Val Leu Ser Leu
85 90 95
Leu Gly Ser Leu Arg Ser Arg Ala Ser Asp Glu Leu Ala Arg Ile Phe
100 105 110
Gly Thr Gln Ala Asp Ile Gly Ser Arg Ala Ala Asp Ile Gly His Gly
115 120 125
Ile Lys Gln Ile Gly Arg Asn Ile Ala Glu Gln Ile Gly Arg Phe Ser
130 135 140
Arg Glu Pro Glu Ser Ala Asn Ile Gly Asn Glu Ala Leu Ala Asp Cys
145 150 155 160
Leu Asp Glu Ile Ser Arg Leu Arg Asp Gly Val Glu Arg Leu Asn Glu
165 170 175
Arg Leu Asp Arg Leu Glu Arg Asp Ile Trp Ile Asp

<210> 1931
 <211> 396
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1931
 atggttgtgg atagactcga aattctcgct ctgcacgacg aaactcttga tgcgtttgtc 60
 ggcaatcagc gaagtagcga catcgcgcac catatcttcc acgaatttcg ggttttcgta 120
 ggctttttcg gtaacgtatt ttcatcggg gcgtttgagc aggccgtaga gttggcagct 180
 cgctgcgtt tccacataat cgataacttc ctgcataccg acttcggcat cggaagtcag 240
 gctgacggta acgtgcgaac gctgattatg cgcgccatat tgggaaattt ctttgaaca 300
 cgggcaaagc gaggttacgg gaatcatgac cttcatactg tggccgtatg ccccgctctt 360
 catttcaccc gtgaggctga catcataatc cagtaa 396

<210> 1932
 <211> 131
 <212> PRT
 <213> *Neisseria gonorrhoeae*

<400> 1932
 Met Val Val Asp Arg Leu Glu Ile Leu Ala Leu Asp Asp Glu Thr Leu
 1 5 10 15
 Asp Ala Phe Val Gly Asn Gln Arg Ser Ser Asp Ile Ala His His Ile
 20 25 30
 Phe His Glu Phe Arg Val Phe Val Gly Leu Phe Gly Asn Val Phe Phe
 35 40 45
 Ile Gly Ala Phe Glu Gln Ala Val Glu Leu Ala Ala Arg Leu Arg Phe
 50 55 60
 His Ile Ile Asp Asn Phe Leu Asp Thr Asp Phe Gly Ile Gly Ser Gln
 65 70 75 80
 Ala Asp Gly Asn Val Arg Thr Leu Ile Met Arg Ala Ile Leu Gly Asn
 85 90 95
 Phe Phe Gly Thr Arg Ala Lys Arg Gly Tyr Gly Asn His Asp Leu His
 100 105 110
 Thr Val Ala Val Cys Pro Val Phe His Phe Thr Arg Glu Ala Asp Ile
 115 120 125
 Ile Ile Gln
 130

<210> 1933
 <211> 396
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1933

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atggttgtgg atagactcga aattctcgct ctcgacgacg aaactcttga tgcgtttgtc 60
ggcaatcagc gaagtagcga catcgcgcac catatcttcc acgaatttcg ggttttcgta 120
ggctttttcg gtaacgtatt ttcatcggg gcgtttgagc aggccgtaga gttggcagct 180
cgcttgcgcc tccacataat cgatgacttc ctcgataccg acttcggcat cggcagtcag 240
gctgacggta acgtgcgaac gctggttgtg cgcgcgctat tgggaaattt ctttgggaaca 300
cgggcaaagc gaggttacgg gaatcatgac cttcatactg tggccgtatg ccccgctttt 360
gatttcgccc gtgagacaga catcataatc cagtaa 396
```

<210> 1934

<211> 131

<212> PRT

<213> *Neisseria meningitidis*

<400> 1934

```
Met Val Val Asp Arg Leu Glu Ile Leu Ala Leu Asp Asp Glu Thr Leu
  1             5             10             15

Asp Ala Phe Val Gly Asn Gln Arg Ser Ser Asp Ile Ala His His Ile
      20             25             30

Phe His Glu Phe Arg Val Phe Val Gly Phe Phe Gly Asn Val Phe Phe
      35             40             45

Ile Gly Ala Phe Glu Gln Ala Val Glu Leu Ala Ala Arg Leu Arg Leu
      50             55             60

His Ile Ile Asp Asp Phe Leu Asp Thr Asp Phe Gly Ile Gly Ser Gln
      65             70             75             80

Ala Asp Gly Asn Val Arg Thr Leu Val Val Arg Ala Val Leu Gly Asn
      85             90             95

Phe Phe Gly Thr Arg Ala Lys Arg Gly Tyr Gly Asn His Asp Leu His
      100            105            110

Thr Val Ala Val Cys Pro Val Phe Asp Phe Ala Arg Glu Thr Asp Ile
      115            120            125

Ile Ile Gln
      130
```

<210> 1935

<211> 396

<212> DNA

<213> *Neisseria meningitidis*

<400> 1935

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atggttgtgg atagactcga aattctcgct ctcgacgacg aaactcttga tgcgtttgtc 60
ggcaatcagc gaagtagcga catcgcgcac catatcttcc acgaatttcg ggttttcgta 120
ggctttttcg gtaacgtatt ttcatcggg gcgtttgagc aggccgtaga gttggcagct 180
cgcttgcgcc tccacataat cgatgacttc ctcgataccg acttcggcat cggcagtcag 240
gctgacggta acgtgcgaac gctggttgtg cgcgccatat tgggaaattt ctttgggaaca 300
cgggcaaagc gaggttacgg gaatcatgac cttcatactg tggccgtatg caccgtcttt 360
catttcgccc gtgaggctga catcataatc cagtaa 396
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<210> 1936
 <211> 131
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1936
 Met Val Val Asp Arg Leu Glu Ile Leu Ala Leu Asp Asp Glu Thr Leu
 1 5 10 15
 Asp Ala Phe Val Gly Asn Gln Arg Ser Ser Asp Ile Ala His His Ile
 20 25 30
 Phe His Glu Phe Arg Val Phe Val Gly Phe Phe Gly Asn Val Phe Phe
 35 40 45
 Ile Gly Ala Phe Glu Gln Ala Val Glu Leu Ala Ala Arg Leu Arg Leu
 50 55 60
 His Ile Ile Asp Asp Phe Leu Asp Thr Asp Phe Gly Ile Gly Ser Gln
 65 70 75 80
 Ala Asp Gly Asn Val Arg Thr Leu Val Val Arg Ala Ile Leu Gly Asn
 85 90 95
 Phe Phe Gly Thr Arg Ala Lys Arg Gly Tyr Gly Asn His Asp Leu His
 100 105 110
 Thr Val Ala Val Cys Thr Val Phe His Phe Ala Arg Glu Ala Asp Ile
 115 120 125
 Ile Ile Gln
 130

<210> 1937
 <211> 1017
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 1937
 atgattggag ggcttatgca atttccttac cgcaatgttc cggtttcgcg tatgcgccgt 60
 atgcgcaggg atgatttttc acgccgcctg atgcgcgagc atatgctgac cgccgatgat 120
 ttgatttata cggtgttcgt attggagggg gcggcgcgcg aggaggatgt gccttctatg 180
 ccgggcgtga agcgtcagag tttggacagg ctgctgttta cggcggaaga ggcggtgaag 240
 ctccgtattc cgatgttggc actctttccc gtggttacgg caaacaaaac cgggcgtgcg 300
 caggaggcgt acaatcccga aggactcgtg ccgtcaactg tccgagcctt gcgcgagagg 360
 tttcccgaac tggggattat gacggatgtc gcgctcgatc cttatacggg gcacggtcag 420
 gacggactga cggacgaaaa cggttacgtg atgaatgatg aaaccgtaga agtcttggtg 480
 aaacaggctt tatgtcatgc agaggcgggc acgcaggctg ttgctccttc cgatatgatg 540
 gacgggcgta tcggcgccat ccgcgaggct ttggaggatg ccggacatat ccatacgcg 600
 attatggcat attccgcaa atagtcttct gcattctacg gccctttccg tgatgcggta 660
 ggcagttcgg gcaatttggg aaaggcagat aaaaagacct atcagatgga tcctgcaaat 720
 accgatgagg cgctgcatga agtggcgctc gatattcagg aagggtgcgga tatggtgatg 780
 gtgaagcccc gtttgcgta tttggacgtt gtccgccgcg tgaaggacga gttcggcgta 840
 ccgacttatg cctatcagggt ttcgggcgaa tatgcgatgt tgcaggcggc ggttgccaac 900

ggctggctgg acggcggeaa agtggttttg gaaagcctgc tggcattcaa acgtgcgggg 960
 gcggacggga ttttgaccta ttacgccatt gaggcggcaa agatgctgaa gcgttga 1017

<210> 1938
 <211> 338
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1938
 Met Ile Gly Gly Leu Met Gln Phe Pro Tyr Arg Asn Val Pro Ala Ser
 1 5 10 15
 Arg Met Arg Arg Met Arg Arg Asp Asp Phe Ser Arg Arg Leu Met Arg
 20 25 30
 Glu His Met Leu Thr Ala Asp Asp Leu Ile Tyr Pro Val Phe Val Leu
 35 40 45
 Glu Gly Ala Ala Arg Glu Glu Asp Val Pro Ser Met Pro Gly Val Lys
 50 55 60
 Arg Gln Ser Leu Asp Arg Leu Leu Phe Thr Ala Glu Glu Ala Val Lys
 65 70 75 80
 Leu Gly Ile Pro Met Leu Ala Leu Phe Pro Val Val Thr Ala Asn Lys
 85 90 95
 Thr Gly Arg Ala Gln Glu Ala Tyr Asn Pro Glu Gly Leu Val Pro Ser
 100 105 110
 Thr Val Arg Ala Leu Arg Glu Arg Phe Pro Glu Leu Gly Ile Met Thr
 115 120 125
 Asp Val Ala Leu Asp Pro Tyr Thr Val His Gly Gln Asp Gly Leu Thr
 130 135 140
 Asp Glu Asn Gly Tyr Val Met Asn Asp Glu Thr Val Glu Val Leu Val
 145 150 155 160
 Lys Gln Ala Leu Cys His Ala Glu Ala Gly Thr Gln Val Val Ala Pro
 165 170 175
 Ser Asp Met Met Asp Gly Arg Ile Gly Ala Ile Arg Glu Ala Leu Glu
 180 185 190
 Asp Ala Gly His Ile His Thr Arg Ile Met Ala Tyr Ser Ala Lys Tyr
 195 200 205
 Ala Ser Ala Phe Tyr Gly Pro Phe Arg Asp Ala Val Gly Ser Ser Gly
 210 215 220
 Asn Leu Gly Lys Ala Asp Lys Lys Thr Tyr Gln Met Asp Pro Ala Asn
 225 230 235 240
 Thr Asp Glu Ala Leu His Glu Val Ala Leu Asp Ile Gln Glu Gly Ala
 245 250 255

Asp Met Val Met Val Lys Pro Gly Leu Pro Tyr Leu Asp Val Val Arg
 260 265 270
 Arg Val Lys Asp Glu Phe Gly Val Pro Thr Tyr Ala Tyr Gln Val Ser
 275 280 285
 Gly Glu Tyr Ala Met Leu Gln Ala Ala Val Ala Asn Gly Trp Leu Asp
 290 295 300
 Gly Gly Lys Val Val Leu Glu Ser Leu Leu Ala Phe Lys Arg Ala Gly
 305 310 315 320
 Ala Asp Gly Ile Leu Thr Tyr Tyr Ala Ile Glu Ala Ala Lys Met Leu
 325 330 335

Lys Arg

<210> 1939
 <211> 1017
 <212> DNA
 <213> Neisseria meningitidis

<400> 1939
 atgattggag ggcttatgca gtttccttac cgcaatgttc cgggttcgcg tatgcgccgt 60
 atgcgcaggg acgatttttc acgccgcctg atgcgcgaac acacgctgac cgccgatgat 120
 ttgatttata cgggtgttcgt attggagggg tcggcgcgcg aggaggatgt gccttctatg 180
 ccgggtgtga agcgtcaaaag tttggacagg ctgctgttta cggcggaaga ggcggtaaag 240
 ctcggtattc cgatgtttggc actgttcccc gtggttacgg caaacaaaac cgagcgtgcg 300
 caggaggcgt acaatcccga aggactcgtg ccgtcaactg tccgcgcctt gcgcgagagg 360
 tttcccgaac tgggcattat gacggatgtc gcgctcgatc cttatacggg tcacggtcag 420
 gacgggctga cggacgaaaa cggttatgtg atgaacgatg aaaccgtaga ggttttggtc 480
 aagcaggcctt tgtgccacgc tgaagcgggc gcgcagggtg ttgcccttc cgatatgatg 540
 gacgggcgta tcggtgcgat tcgcgaggcg ttggaggatg ccgggcataat ccatacgcgg 600
 attatggcgt attccgccaa atatgcttct gcatttttac gccctttccg tgatgcggta 660
 ggcagttcgg gcaatttggg caaggcagat aaaaagacct accagatgga tccggcaaatt 720
 accgatgagg cgttgcacga agtggcggtg gacattcagg aagggtgcgga tatggtaattg 780
 gtcaagcccg gtttgccgta tttggacgtt gtccgccgcg taaaggacga gttcgggtgtg 840
 ccgacttatg cctatcaggt ttcgggagaa tacgcgatgt tgcaggcagc gattgccaac 900
 ggctggctgg acggcggcaa agtggttttg gaaagcctgc tggcattcaa acgtgcgggt 960
 gcggacggga ttttgaccta ttacgctatt gaggcggcaa agatgttgaa gcgttgaa 1017

<210> 1940
 <211> 338
 <212> PRT
 <213> Neisseria meningitidis

<400> 1940
 Met Ile Gly Gly Leu Met Gln Phe Pro Tyr Arg Asn Val Pro Ala Ser
 1 5 10 15
 Arg Met Arg Arg Met Arg Arg Asp Asp Phe Ser Arg Arg Leu Met Arg
 20 25 30

Glu His Thr Leu Thr Ala Asp Asp Leu Ile Tyr Pro Val Phe Val Leu
 35 40 45

Glu Gly Ser Ala Arg Glu Glu Asp Val Pro Ser Met Pro Gly Val Lys
 50 55 60

Arg Gln Ser Leu Asp Arg Leu Leu Phe Thr Ala Glu Glu Ala Val Lys
 65 70 75 80

Leu Gly Ile Pro Met Leu Ala Leu Phe Pro Val Val Thr Ala Asn Lys
 85 90 95

Thr Glu Arg Ala Gln Glu Ala Tyr Asn Pro Glu Gly Leu Val Pro Ser
 100 105 110

Thr Val Arg Ala Leu Arg Glu Arg Phe Pro Glu Leu Gly Ile Met Thr
 115 120 125

Asp Val Ala Leu Asp Pro Tyr Thr Val His Gly Gln Asp Gly Leu Thr
 130 135 140

Asp Glu Asn Gly Tyr Val Met Asn Asp Glu Thr Val Glu Val Leu Val
 145 150 155 160

Lys Gln Ala Leu Cys His Ala Glu Ala Gly Ala Gln Val Val Ala Pro
 165 170 175

Ser Asp Met Met Asp Gly Arg Ile Gly Ala Ile Arg Glu Ala Leu Glu
 180 185 190

Asp Ala Gly His Ile His Thr Arg Ile Met Ala Tyr Ser Ala Lys Tyr
 195 200 205

Ala Ser Ala Phe Tyr Gly Pro Phe Arg Asp Ala Val Gly Ser Ser Gly
 210 215 220

Asn Leu Gly Lys Ala Asp Lys Lys Thr Tyr Gln Met Asp Pro Ala Asn
 225 230 235 240

Thr Asp Glu Ala Leu His Glu Val Ala Leu Asp Ile Gln Glu Gly Ala
 245 250 255

Asp Met Val Met Val Lys Pro Gly Leu Pro Tyr Leu Asp Val Val Arg
 260 265 270

Arg Val Lys Asp Glu Phe Gly Val Pro Thr Tyr Ala Tyr Gln Val Ser
 275 280 285

Gly Glu Tyr Ala Met Leu Gln Ala Ala Ile Ala Asn Gly Trp Leu Asp
 290 295 300

Gly Gly Lys Val Val Leu Glu Ser Leu Leu Ala Phe Lys Arg Ala Gly
 305 310 315 320

Ala Asp Gly Ile Leu Thr Tyr Tyr Ala Ile Glu Ala Ala Lys Met Leu
 325 330 335

Lys Arg

<210> 1941

<211> 1017

<212> DNA

<213> *Neisseria meningitidis*

<400> 1941

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atgattggag ggcttatgca gtttccttac cgcaatgttt cggcttcgcg tatgcgccgt 60
atgcgcaggg acgatttttc acgccgcctg atgcgcgagc atacgctgac tgccgatgat 120
ttgattttatc cgggtgttcgt attggagggg tcggcgcgcg aggaggatgt gccttctatg 180
ccggggcgta agcgtcagag tttggacagg ctgctgttta cggcggaaga ggcggtaaag 240
ctcggtattc cgatgttggc actgttcccc gtggttacgg caaacaaaac cgagcgtgcg 300
caggaggcgt acaatcccga aggactcgtg ccgtcaactg tccgcgcctt gcgcgagagg 360
tttcccgaac tgggcattat gacggatgtc gcgctcgatc cttatacggg gcacggtcag 420
gacgggctga cggacgaaaa cggttatgtg atgaacgatg aaaccgtaga ggttttggtc 480
aagcaggctt tgtgtcatgc agaggcaggc gcacaggtcg ttgctccttc cgatatgatg 540
gatgggcgta tcggtgcgat tcgcgaggcg ttggaggatg cggggcatat ccatacgcg 600
attatggcgt attccgccaa atatgcttct gcattttacg gccctttccg tgatgcggta 660
ggcagttcgg gcaatttggg caaggcagat aaaaagacct accagatgga tccggcaaat 720
accgatgagg cgttgcacga agtggcggtt gacattcagg aaggtgcgga tatggtgatg 780
gtcaagcccg gtttgccgta tttggacggt gtccgcgcg tgaaggacga gttcggcggtg 840
ccgacttatg cctatcaggt ttcgggagaa tacgcgatgc tgcaggcggc ggttgccaac 900
ggctggctgg acggcggcaa agtggttttg gaaagcctgc tggcattcaa acgtgcgggt 960
gcggatggga ttttgacctt ttacgccatt gaggcggcaa agatgctgaa gcgttga 1017
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<210> 1942

<211> 338

<212> PRT

<213> *Neisseria meningitidis*

<400> 1942

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Met Ile Gly Gly Leu Met Gln Phe Pro Tyr Arg Asn Val Ser Ala Ser
 1             5             10             15

Arg Met Arg Arg Met Arg Arg Asp Asp Phe Ser Arg Arg Leu Met Arg
      20             25             30

Glu His Thr Leu Thr Ala Asp Asp Leu Ile Tyr Pro Val Phe Val Leu
      35             40             45

Glu Gly Ser Ala Arg Glu Glu Asp Val Pro Ser Met Pro Gly Val Lys
      50             55             60

Arg Gln Ser Leu Asp Arg Leu Leu Phe Thr Ala Glu Glu Ala Val Lys
      65             70             75             80

Leu Gly Ile Pro Met Leu Ala Leu Phe Pro Val Val Thr Ala Asn Lys
      85             90             95

Thr Glu Arg Ala Gln Glu Ala Tyr Asn Pro Glu Gly Leu Val Pro Ser
      100            105            110
```


Thr Val Arg Ala Leu Arg Glu Arg Phe Pro Glu Leu Gly Ile Met Thr
 115 120 125
 Asp Val Ala Leu Asp Pro Tyr Thr Val His Gly Gln Asp Gly Leu Thr
 130 135 140
 Asp Glu Asn Gly Tyr Val Met Asn Asp Glu Thr Val Glu Val Leu Val
 145 150 155 160
 Lys Gln Ala Leu Cys His Ala Glu Ala Gly Ala Gln Val Val Ala Pro
 165 170 175
 Ser Asp Met Met Asp Gly Arg Ile Gly Ala Ile Arg Glu Ala Leu Glu
 180 185 190
 Asp Ala Gly His Ile His Thr Arg Ile Met Ala Tyr Ser Ala Lys Tyr
 195 200 205
 Ala Ser Ala Phe Tyr Gly Pro Phe Arg Asp Ala Val Gly Ser Ser Gly
 210 215 220
 Asn Leu Gly Lys Ala Asp Lys Lys Thr Tyr Gln Met Asp Pro Ala Asn
 225 230 235 240
 Thr Asp Glu Ala Leu His Glu Val Ala Leu Asp Ile Gln Glu Gly Ala
 245 250 255
 Asp Met Val Met Val Lys Pro Gly Leu Pro Tyr Leu Asp Val Val Arg
 260 265 270
 Arg Val Lys Asp Glu Phe Gly Val Pro Thr Tyr Ala Tyr Gln Val Ser
 275 280 285
 Gly Glu Tyr Ala Met Leu Gln Ala Ala Val Ala Asn Gly Trp Leu Asp
 290 295 300
 Gly Gly Lys Val Val Leu Glu Ser Leu Leu Ala Phe Lys Arg Ala Gly
 305 310 315 320
 Ala Asp Gly Ile Leu Thr Tyr Tyr Ala Ile Glu Ala Ala Lys Met Leu
 325 330 335

Lys Arg

<210> 1943

<211> 543

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1943

atgccgtctg aaaacgggat gggaaaacgg cagcttgctg gctgccgttt gttcgggaag 60
 ttaagccttg ttttcaggct gctgcccgga ctctgtcgag gcggtgtctg ccggggcagg 120
 tgcttcggtt ttttcccgag tcggagcgtg cggcgcgtta tcttccgccc cgtccgcatt 180
 ctgcgcagg ttgtggctgt tatccttggg cgggctgggt tgtttgcgccc ccataatttc 240
 cagtaccta tcgcgggtcta tggtttccca ttccatcagg gctttgcaca tcgtttccat 300

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cttgctcgcg ttttcatcga ggattttgta ggcaacctga tactgctcgt ccaaaatccg 360
gcggatttcc gcgtcgatgt cctgctgggt tttctcgga atgttttgcg aacgggttac 420
gctgcgcccc aagaagactt cgccttcggt ttccgcataa accatcacgc ccattttgtc 480
gctcatgccc tagcgcgtta ccatttcgcg tgccatttggt gttgcgcgtt caaagtcgtt 540
tga 543

```

<210> 1944
 <211> 180
 <212> PRT
 <213> *Neisseria gonorrhoeae*

```

<400> 1944
Met Pro Ser Glu Asn Gly Met Gly Lys Arg Gln Leu Ala Gly Cys Arg
 1          5          10          15
Leu Phe Gly Lys Leu Ser Leu Val Phe Arg Leu Leu Pro Gly Leu Cys
          20          25          30
Arg Gly Gly Val Cys Arg Gly Arg Cys Phe Gly Phe Phe Pro Ser Arg
          35          40          45
Ser Val Arg Arg Val Ile Phe Arg Arg Val Arg Ile Leu Ala Gln Val
          50          55          60
Val Ala Val Ile Leu Gly Arg Ala Gly Leu Phe Ala Arg His Asn Phe
          65          70          75          80
Gln Tyr Leu Ile Ala Val Tyr Gly Phe Pro Phe His Gln Gly Phe Ala
          85          90          95
His Arg Phe His Leu Val Ala Val Phe Ile Glu Asp Phe Val Gly Asn
          100          105          110
Leu Ile Leu Leu Val Gln Asn Pro Ala Asp Phe Arg Val Asp Val Leu
          115          120          125
Leu Gly Phe Leu Gly Asn Val Leu Arg Thr Gly Tyr Ala Ala Pro Gln
          130          135          140
Glu Asp Phe Ala Phe Val Phe Arg Ile Asn His His Ala His Phe Val
          145          150          155          160
Ala His Ala Val Ala Arg Tyr His Phe Ala Cys His Leu Gly Cys Ala
          165          170          175
Phe Lys Val Val
          180

```

<210> 1945
 <211> 543
 <212> DNA
 <213> *Neisseria meningitidis*

```

<400> 1945
atgccgtctg aaaacgggat gggaacgg cagcttgccg gctgccgttt gttcgggaag 60

```

ttaagccttg ttttcaggct gctgctcgga ctctgtcgaa gcggtgtctg ccggggcagg 120
 tgcttcgggt ttttcccgag tcggagcgtg cggcgcggtta tcttccgccg cggtccgcatt 180
 ctcgcgcagg ttgtggctgt aatctttggg cgggctgggt tgtttgcccg ccatgatttc 240
 cagtacctga tcgcggtcga tggtttccca ttccatcagg gctttgcaca tcgtttccat 300
 cttgtcgcgg ttttcatcga ggattttgta ggcaacctga tattgctcgt ccaaaatccg 360
 gcggattttcc gcgtcgatgt cctgctgggt tttctcggaa atgttttgcg aacggggttac 420
 gctgcgtccc aagaagactt cgccttcggt ttccgcataa accatcacgc ccattttgtc 480
 gctcatgccg tagcgcggtta ccatttcgcg cgccatttgg gttgcgcgtt caaagtcggt 540
 tga 543

<210> 1946

<211> 180

<212> PRT

<213> *Neisseria meningitidis*

<400> 1946

Met Pro Ser Glu Asn Gly Met Gly Lys Arg Gln Leu Ala Gly Cys Arg
 1 5 10 15

Leu Phe Gly Lys Leu Ser Leu Val Phe Arg Leu Leu Leu Gly Leu Cys
 20 25 30

Arg Ser Gly Val Cys Arg Gly Arg Cys Phe Gly Phe Phe Pro Ser Arg
 35 40 45

Ser Val Arg Arg Val Ile Phe Arg Arg Val Arg Ile Leu Ala Gln Val
 50 55 60

Val Ala Val Ile Phe Gly Arg Ala Gly Leu Phe Ala Arg His Asp Phe
 65 70 75 80

Gln Tyr Leu Ile Ala Val Asp Gly Phe Pro Phe His Gln Gly Phe Ala
 85 90 95

His Arg Phe His Leu Val Ala Val Phe Ile Glu Asp Phe Val Gly Asn
 100 105 110

Leu Ile Leu Leu Val Gln Asn Pro Ala Asp Phe Arg Val Asp Val Leu
 115 120 125

Leu Gly Phe Leu Gly Asn Val Leu Arg Thr Gly Tyr Ala Ala Ser Gln
 130 135 140

Glu Asp Phe Ala Phe Val Phe Arg Ile Asn His His Ala His Phe Val
 145 150 155 160

Ala His Ala Val Ala Arg Tyr His Phe Ala Arg His Leu Gly Cys Ala
 165 170 175

Phe Lys Val Val
 180

<210> 1947

<211> 543

<212> DNA

<213> Neisseria meningitidis

<400> 1947

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atgccgtctg aaaacaggat gggaaaacgg cagcttgccg gctgccgttt gttcgggaag 60
ttaagccttg ttttcaggct gctgctcgga ctctgtcgaa gcggtgtctg ccggggcagg 120
tgcttcgggt tcttcccgag tcggagcgtg cggcgcggtt tcttccgccg cgtccgcatt 180
ctcgcgcagg ttgtggctgt aatctttggg cgggctgggt tgtttgccc ccatgatttc 240
cagtacctga tcgcggtcga tggtttccca ttccatcagg gctttgcaca tcgtttccat 300
cttgtcgcgg ttttcacga ggattttgta ggcaacctga tactgctcgt ccaaaatccg 360
gcggatttcc gcacgatgt cctgctgggt tttctcgga atgttttgcg aacgggttac 420
gctgcgtccc aagaagactt cgccttcgtt ttccgcataa accatcacgc ccattttgtc 480
gctcatgccg tagcgcgtta ccatttcgcg cgccatttgg gttgcgcgtt caaagtcgtt 540
tga 543
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<210> 1948

<211> 180

<212> PRT

<213> Neisseria meningitidis

<400> 1948

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Met Pro Ser Glu Asn Arg Met Gly Lys Arg Gln Leu Ala Gly Cys Arg
  1              5              10              15

Leu Phe Gly Lys Leu Ser Leu Val Phe Arg Leu Leu Leu Gly Leu Cys
      20              25              30

Arg Ser Gly Val Cys Arg Gly Arg Cys Phe Gly Phe Phe Pro Ser Arg
      35              40              45

Ser Val Arg Arg Val Ile Phe Arg Arg Val Arg Ile Leu Ala Gln Val
      50              55              60

Val Ala Val Ile Phe Gly Arg Ala Gly Leu Phe Ala Arg His Asp Phe
      65              70              75              80

Gln Tyr Leu Ile Ala Val Asp Gly Phe Pro Phe His Gln Gly Phe Ala
      85              90              95

His Arg Phe His Leu Val Ala Val Phe Ile Glu Asp Phe Val Gly Asn
      100              105              110

Leu Ile Leu Leu Val Gln Asn Pro Ala Asp Phe Arg Ile Asp Val Leu
      115              120              125

Leu Gly Phe Leu Gly Asn Val Leu Arg Thr Gly Tyr Ala Ala Ser Gln
      130              135              140

Glu Asp Phe Ala Phe Val Phe Arg Ile Asn His His Ala His Phe Val
      145              150              155              160

Ala His Ala Val Ala Arg Tyr His Phe Ala Arg His Leu Gly Cys Ala
      165              170              175

Phe Lys Val Val
      180
```

<210> 1949
<211> 375
<212> DNA
<213> *Neisseria gonorrhoeae*

<400> 1949
atgggcttcg gcggcaatat tgcaaaaaag ctggccgggg tagatgaaat agcctttgac 60
tttgacggca tcgtctttga tttcgggcgt gatgatgctg tccggcatag cggcgtaatc 120
aatgctgctg tcgccggcct gcatatagtc ggtgaagttt tcgctgataa agcggtagaa 180
aagtgtgccg agaacgtatt gtttaaagtc ccagccatcc accgcgccgc gtacttcgtc 240
ggcgattttc caaatttggc ggtgcagttg ggcgcggttg tgcatttcgg tcatcatcga 300
aatccatata taaagttaaa caaatcaaaa tcgcctgata ttttcagacg atttttttac 360
gggcattcaa attaa 375

<210> 1950
<211> 124
<212> PRT
<213> *Neisseria gonorrhoeae*

<400> 1950
Met Gly Phe Gly Gly Asn Ile Ala Lys Lys Leu Ala Gly Val Asp Glu
1 5 10 15
Ile Ala Phe Asp Phe Asp Gly Ile Val Phe Asp Phe Gly Arg Asp Asp
20 25 30
Ala Val Arg His Ser Gly Val Ile Asn Ala Ala Val Ala Gly Leu His
35 40 45
Ile Val Gly Glu Val Phe Ala Asp Lys Ala Val Glu Lys Cys Ala Glu
50 55 60
Asn Val Leu Phe Lys Val Pro Ala Ile His Arg Ala Ala Tyr Phe Val
65 70 75 80
Gly Asp Phe Pro Asn Leu Ala Val Gln Leu Gly Ala Leu Leu His Phe
85 90 95
Gly His His Arg Asn Pro Tyr Ile Lys Leu Asn Lys Ser Lys Ser Pro
100 105 110
Asp Ile Phe Arg Arg Phe Phe Tyr Gly His Ser Asn
115 120

<210> 1951
<211> 374
<212> DNA
<213> *Neisseria meningitidis*

<400> 1951
atgggcttcg gcggcaatat tgcaaaaaag ctggccgggg tagatgaaat agcctttaac 60
tttgacggca tcgtctttga tttcgggcgt gatgatgctg tccggcatag cggcgtaatc 120
aatactgctg tcgcctgcct gcatatagtc ggtgaagttt tcgctgataa agcggtagaa 180
aagtgtgccg agaacgtatt gtttaaagtc ccagccatcc accgcgccgc gtacttcgtc 240

ggcaattttc caaatttggc ggtgcagttg ggcgcggttg tgcatttcgg tcatcatcga 300
aatccatata aaagttaaac aaatcaaaaat cgctgatat tttcagacga tttttttacg 360
ggcattcaaa ttaa 374

<210> 1952
<211> 124
<212> PRT
<213> Neisseria meningitidis

<400> 1952
Met Gly Phe Gly Gly Asn Ile Ala Lys Lys Leu Ala Gly Val Asp Glu
1 5 10 15
Ile Ala Phe Asn Phe Asp Gly Ile Val Phe Asp Phe Gly Arg Asp Asp
20 25 30
Ala Val Arg His Ser Gly Val Ile Asn Thr Ala Val Ala Cys Leu His
35 40 45
Ile Val Gly Glu Val Phe Ala Asp Lys Ala Val Glu Lys Cys Ala Glu
50 55 60
Asn Val Leu Phe Lys Val Pro Ala Ile His Arg Ala Ala Tyr Phe Val
65 70 75 80
Gly Asn Phe Pro Asn Leu Ala Val Gln Leu Gly Ala Leu Leu His Phe
85 90 95
Gly His His Arg Asn Pro Tyr Xaa Lys Leu Asn Lys Ser Lys Ser Pro
100 105 110
Asp Ile Phe Arg Arg Phe Phe Tyr Gly His Ser Asn
115 120

<210> 1953
<211> 373
<212> DNA
<213> Neisseria meningitidis

<400> 1953
atgggcttcg gcggcaatat tgcaaaaaag ctggccgggg tagatgaaat agcctttgac 60
tttgacggca tcgtctttga tttcgggctg gatgatgctg tccggcatag cggcgtaatc 120
aatactgctg tcgcctgcct gcatatagtc ggtaaagttt tcgctgataa agcggtagaa 180
aagtgtgccg agaacgtatt gtttgaagtc ccagccatcc accgcgccgc gtacttcgtc 240
ggcaattttc caaatttggc ggtgcagttg ggcgcggttg tgtatttcgg tcatcatcga 300
aatccatata aaagttaaac aaatcaaaaat cgctgatat tttcagacga tttttttacg 360
gcattcaaat taa 373

<210> 1954
<211> 124
<212> PRT
<213> Neisseria meningitidis

<400> 1954

Met Gly Phe Gly Gly Asn Ile Ala Lys Lys Leu Ala Gly Val Asp Glu
1 5 10 15
Ile Ala Phe Asp Phe Asp Gly Ile Val Phe Asp Phe Gly Arg Asp Asp
20 25 30
Ala Val Arg His Ser Gly Val Ile Asn Thr Ala Val Ala Cys Leu His
35 40 45
Ile Val Gly Lys Val Phe Ala Asp Lys Ala Val Glu Lys Cys Ala Glu
50 55 60
Asn Val Leu Phe Glu Val Pro Ala Ile His Arg Ala Ala Tyr Phe Val
65 70 75 80
Gly Asn Phe Pro Asn Leu Ala Val Gln Leu Gly Ala Leu Leu Tyr Phe
85 90 95
Gly His His Arg Asn Pro Tyr Xaa Lys Leu Asn Lys Ser Lys Ser Pro
100 105 110
Asp Ile Phe Arg Arg Phe Phe Xaa Gly His Ser Asn
115 120

<210> 1955
<211> 615
<212> DNA
<213> Neisseria gonorrhoeae

<400> 1955
atgtcgcgtt cgagcctgtc gaggcgttcg ttgaggcgtt ccacgccgtc gcgcagtcgtg 60
cttatttcgt cgaggcagtc ggcaagggtc tcgttgccgg tgtttgccga ctccgggttcg 120
cgggaaaatc cgccgatttg ttcggcgatg ttcctgccga tttgtttgat gccgtgtccg 180
atgtcgggtg cacggctgcc gatgcctgcc tgcgtgccga aaatccgtgc caattcgtcc 240
gatgcgcggg aacgcaggct gccgagcagg gacagtaccg cgatgccgag gatgaggctc 300
ccttcgagcc tgatgtcgcc agccccgggt tcgccgcctt ggaggatttt ccgtatcgcg 360
ctgttgccga aggtaatctt ggtgtctgca aagccgtttc ccgccgagag caaacctct 420
tctgtgatgc gtcccgccag tttcagccc gcaatgttca gggtcagtgt tttgcctgca 480
aaggaggtaa gttccgagcg gctgtccggg ctttcagaa tcaggcgggt gatgatggg 540
aggagggcgg acatattttc tgattggggc ggagaatgcc tgttggttgc gttgccgctt 600
attttacagg cttaa 615

<210> 1956
<211> 204
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1956
Met Ser Arg Ser Ser Leu Ser Arg Arg Ser Leu Arg Arg Ser Thr Pro
1 5 10 15
Ser Arg Ser Leu Leu Ile Ser Ser Arg Gln Ser Ala Arg Ala Ser Leu
20 25 30
Pro Val Phe Ala Asp Ser Gly Ser Arg Glu Asn Pro Pro Ile Cys Ser

| | | |
|---|-----|-------------|
| 35 | 40 | 45 |
| Ala Met Phe Leu Pro Ile Cys Leu Met Pro Cys Pro Met Ser Val Ala | | |
| 50 | 55 | 60 |
| Arg Leu Pro Met Pro Ala Cys Val Pro Lys Ile Arg Ala Asn Ser Ser | | |
| 65 | 70 | 75 80 |
| Asp Ala Arg Glu Arg Arg Leu Pro Ser Arg Asp Ser Thr Ala Met Pro | | |
| | 85 | 90 95 |
| Arg Met Arg Ser Pro Ser Ser Leu Met Ser Pro Ala Pro Gly Ser Pro | | |
| | 100 | 105 110 |
| Pro Trp Arg Ile Phe Arg Ile Ala Leu Leu Arg Lys Val Ile Ser Val | | |
| | 115 | 120 125 |
| Ser Ala Lys Pro Phe Pro Ala Glu Ser Lys Pro Ser Ser Val Met Arg | | |
| | 130 | 135 140 |
| Pro Ala Ser Phe Ser Pro Ala Met Phe Arg Val Ser Val Leu Pro Ala | | |
| | 145 | 150 155 160 |
| Lys Glu Val Ser Ser Glu Arg Leu Ser Gly Leu Cys Arg Ile Arg Arg | | |
| | 165 | 170 175 |
| Leu Met Met Gly Arg Arg Ala Asp Ile Phe Ser Asp Trp Gly Gly Glu | | |
| | 180 | 185 190 |
| Cys Leu Leu Leu Leu Leu Pro Leu Ile Leu Gln Ala | | |
| | 195 | 200 |

<210> 1957
 <211> 615
 <212> DNA
 <213> Neisseria meningitidis

<400> 1957
 atgtcgcgtt cgagccggtc gaggcgttcg ttgaggcgtt ccacgccgtc gcgcagtcctg 60
 cttatttcgt cgaggcagtc ggcaagggct tcgttgccga tgtttgcgga ctcgatttcg 120
 cgggaaaatc cgccgatttg ttccggcgatg ttcctgccga tttgtttgat gccgtgtccg 180
 atgtcggcgg caaggctgcc gatgtctgcc tgcgtgccga aaatccgtgc caattcgtcc 240
 gatgcgcggg aacgcaggct gccgagcagg gacagtaccg cgatgccgag gatgaggtcg 300
 ccttcgagcc cgatgtcgcc cgccccgggt tcgcctcctt ggaggatttt ctgtaccgcg 360
 ctgttgccga aggttaatttc ggtgtctgca aagccgtttc ccgccgagag caaacctct 420
 tccgtgatgc gtcccgccag tttcagcccg gcaatgttca gggtcagtgt tttgcctgca 480
 aaggcggcaa gttccgagcg gctgtccggg ctttgcagaa tcaggcgggt gatgatggg 540
 aggagggcgg acatatatttc tgatcggggc ggagaatgcc tgttggtgct gttgccgctt 600
 attttacagg cttaa 615

<210> 1958
 <211> 204
 <212> PRT
 <213> Neisseria meningitidis

<400> 1958

Met Ser Arg Ser Ser Arg Ser Arg Arg Ser Leu Arg Arg Ser Thr Pro
1 5 10 15
Ser Arg Ser Leu Leu Ile Ser Ser Arg Gln Ser Ala Arg Ala Ser Leu
20 25 30
Pro Met Phe Ala Asp Ser Asp Ser Arg Glu Asn Pro Pro Ile Cys Ser
35 40 45
Ala Met Phe Leu Pro Ile Cys Leu Met Pro Cys Pro Met Ser Ala Ala
50 55 60
Arg Leu Pro Met Ser Ala Cys Val Pro Lys Ile Arg Ala Asn Ser Ser
65 70 75 80
Asp Ala Arg Glu Arg Arg Leu Pro Ser Arg Asp Ser Thr Ala Met Pro
85 90 95
Arg Met Arg Ser Pro Ser Ser Pro Met Ser Pro Ala Pro Gly Ser Pro
100 105 110
Pro Trp Arg Ile Phe Cys Thr Ala Leu Leu Arg Lys Val Ile Ser Val
115 120 125
Ser Ala Lys Pro Phe Pro Ala Glu Ser Lys Pro Ser Ser Val Met Arg
130 135 140
Pro Ala Ser Phe Ser Pro Ala Met Phe Arg Val Ser Val Leu Pro Ala
145 150 155 160
Lys Ala Ala Ser Ser Glu Arg Leu Ser Gly Leu Cys Arg Ile Arg Arg
165 170 175
Leu Met Met Gly Arg Arg Ala Asp Ile Phe Ser Asp Arg Gly Gly Glu
180 185 190
Cys Leu Leu Leu Leu Leu Pro Leu Ile Leu Gln Ala
195 200

<210> 1959

<211> 615

<212> DNA

<213> Neisseria meningitidis

<400> 1959

atgtcgcggt cgagccggtc gaggcgttcg ttgaggcggt ccacgccgtc gcgcagtcgt 60
cttatttcgt cgaggcagtc ggcaagggct tcggtgccga tgtttgccga ctccgggttcg 120
cgggaaaatc tgccgatttg ttccggcgatg ttccctgccga tttgtttgat gccgtgtccg 180
atgtcggcgg caccgctgcc gatgtctgcc tgcgtgccga aaatccgtgc caattcgtcc 240
gatgcgcggg aacgcaggct gccgagcagg gacagtaccg cgatgccgag gatgaggtcg 300
ccttcgagcc cgatgtcgcc cgccccgggt tcgccgcctt ggaggatttt ctgtaccgcg 360
ctgttgccga aggtgatttc ggtgtctgca aagccgtttc ccgccgagag caaacctct 420
tccgtgatgc gtcccgccag tttcaaccgg gcaatgttca gggtcagtgt tttgcctgcg 480
aaggcgcaa gttccgagcg gctgtccggg ctttgcagaa tcaggcggtt gatgatgggg 540
aggagggcgg acatattttc tgatcggggc ggagaatgcc tgttggttgc gttgacgctt 600

attttacagg cttaa

615

<210> 1960

<211> 204

<212> PRT

<213> *Neisseria meningitidis*

<400> 1960

Met Ser Arg Ser Ser Arg Ser Arg Arg Ser Leu Arg Arg Ser Thr Pro
1 5 10 15

Ser Arg Ser Leu Leu Ile Ser Ser Arg Gln Ser Ala Arg Ala Ser Leu
20 25 30

Pro Met Phe Ala Asp Ser Gly Ser Arg Glu Asn Leu Pro Ile Cys Ser
35 40 45

Ala Met Phe Leu Pro Ile Cys Leu Met Pro Cys Pro Met Ser Ala Ala
50 55 60

Arg Leu Pro Met Ser Ala Cys Val Pro Lys Ile Arg Ala Asn Ser Ser
65 70 75 80

Asp Ala Arg Glu Arg Arg Leu Pro Ser Arg Asp Ser Thr Ala Met Pro
85 90 95

Arg Met Arg Ser Pro Ser Ser Pro Met Ser Pro Ala Pro Gly Ser Pro
100 105 110

Pro Trp Arg Ile Phe Cys Thr Ala Leu Leu Arg Lys Val Ile Ser Val
115 120 125

Ser Ala Lys Pro Phe Pro Ala Glu Ser Lys Pro Ser Ser Val Met Arg
130 135 140

Pro Ala Ser Phe Asn Pro Ala Met Phe Arg Val Ser Val Leu Pro Ala
145 150 155 160

Lys Ala Ala Ser Ser Glu Arg Leu Ser Gly Leu Cys Arg Ile Arg Arg
165 170 175

Leu Met Met Gly Arg Arg Ala Asp Ile Phe Ser Asp Arg Gly Gly Glu
180 185 190

Cys Leu Leu Leu Leu Leu Thr Leu Ile Leu Gln Ala
195 200

<210> 1961

<211> 1176

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1961

atggctgcgt tcaacgcttt ggacggcaaa aaagaagaca acgggcaa at cgaatattct 60
cagttcatcc gacaggtcaa caacggcgaa gtatccggcg tcaacatcga aggatccgtc 120

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gtcagcgggtt acctgattaa aggcgagcgc accgacaaaa gcaccttctt caccaacgcg 180
cccttggatg acaacctgat tcaaaccctt ttgaacaaaa acgtccgcgt aaaagtaacg 240
ccggaagaaa aaccgagcgc gctgactgcc ctgtttttaca gcctgctgcc cgtcctgctg 300
ctgattggcg catggttcta ctttatgcgt atgcaggcgg gcggcgggcg aaaaggcggc 360
gcattctcct tcggcaaaaag ccgcgcccgc ctgctggaca aagatgccaa caaagttacc 420
tttgccgatg tcgccggctg cgacgaagcc aaagaagaag tgcaggaaat cgtcgattac 480
ctcaaagcac cgaaccgcta tcaaagcctc ggcggcgctg ttccgcgcgg catcctgctg 540
gcgggcagcc cgggaaccgg taaaacactc ttggcgaaag ccattgcagg cgaggccggc 600
gtgccgttct tcagcatttc cggttccgat tttgtcgaaa tggttcgctcg tgtcgggtgca 660
agccgcgtcc gcgatatggt cgagcaggca aagaaaaacg ccccatgcat tatctttatc 720
gacgagattg acgcggtagg ccgccaacgc ggcgcagggt tgggcggcgg caatgatgag 780
cgcgagcaaa cattaacca attattggtt gaaatggacg gttttgagag caatcagact 840
gtaattgtga ttgcggcaac caaccgcccc gacgtactcg atcctgcgct gcaacgcccc 900
ggccgcttcg accgccaaagt cgtcgtcccc ctgccggaca tccggggggcg cgaacagatn 960
ttgaacgtcc attctaaaaa agtgcccttg gacgaatctg tggatttatt gtcctcgcg 1020
cgcggcacgc ccggtttttc cggcgcggtt ttggcgaaac tgggtcaacga agccccctg 1080
tttgccggcc gccgcaacaa agtgaaagtc gatcaaagcg atttgaagac gccaaagaca 1140
aaatctatat gggtcgggaa cgccgcagta tgggtga 1176

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<210> 1962

<211> 391

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1962

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Met Ala Ala Phe Asn Ala Leu Asp Gly Lys Lys Glu Asp Asn Gly Gln
  1              5              10              15

Ile Glu Tyr Ser Gln Phe Ile Arg Gln Val Asn Asn Gly Glu Val Ser
      20              25              30

Gly Val Asn Ile Glu Gly Ser Val Val Ser Gly Tyr Leu Ile Lys Gly
      35              40              45

Glu Arg Thr Asp Lys Ser Thr Phe Phe Thr Asn Ala Pro Leu Asp Asp
      50              55              60

Asn Leu Ile Gln Thr Leu Leu Asn Lys Asn Val Arg Val Lys Val Thr
      65              70              75              80

Pro Glu Glu Lys Pro Ser Ala Leu Thr Ala Leu Phe Tyr Ser Leu Leu
      85              90              95

Pro Val Leu Leu Leu Ile Gly Ala Trp Phe Tyr Phe Met Arg Met Gln
      100              105              110

Ala Gly Gly Gly Gly Lys Gly Gly Ala Phe Ser Phe Gly Lys Ser Arg
      115              120              125

Ala Arg Leu Leu Asp Lys Asp Ala Asn Lys Val Thr Phe Ala Asp Val
      130              135              140

Ala Gly Cys Asp Glu Ala Lys Glu Glu Val Gln Glu Ile Val Asp Tyr
      145              150              155              160

Leu Lys Ala Pro Asn Arg Tyr Gln Ser Leu Gly Gly Arg Val Pro Arg

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| 165 | | | | | 170 | | | | | 175 | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ile | Leu | Leu | Ala | Gly | Ser | Pro | Gly | Thr | Gly | Lys | Thr | Leu | Leu | Ala |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Lys | Ala | Ile | Ala | Gly | Glu | Ala | Gly | Val | Pro | Phe | Phe | Ser | Ile | Ser | Gly |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Ser | Asp | Phe | Val | Glu | Met | Phe | Val | Gly | Val | Gly | Ala | Ser | Arg | Val | Arg |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Asp | Met | Phe | Glu | Gln | Ala | Lys | Lys | Asn | Ala | Pro | Cys | Ile | Ile | Phe | Ile |
| | 225 | | | | | 230 | | | | | 235 | | | | 240 |
| Asp | Glu | Ile | Asp | Ala | Val | Gly | Arg | Gln | Arg | Gly | Ala | Gly | Leu | Gly | Gly |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Gly | Asn | Asp | Glu | Arg | Glu | Gln | Thr | Leu | Asn | Gln | Leu | Leu | Val | Glu | Met |
| | | | 260 | | | | | 265 | | | | | | 270 | |
| Asp | Gly | Phe | Glu | Ser | Asn | Gln | Thr | Val | Ile | Val | Ile | Ala | Ala | Thr | Asn |
| | | 275 | | | | | | 280 | | | | | 285 | | |
| Arg | Pro | Asp | Val | Leu | Asp | Pro | Ala | Leu | Gln | Arg | Pro | Gly | Arg | Phe | Asp |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Arg | Gln | Val | Val | Val | Pro | Leu | Pro | Asp | Ile | Arg | Gly | Arg | Glu | Gln | Xaa |
| | 305 | | | | | 310 | | | | | 315 | | | | 320 |
| Leu | Asn | Val | His | Ser | Lys | Lys | Val | Pro | Leu | Asp | Glu | Ser | Val | Asp | Leu |
| | | | 325 | | | | | | 330 | | | | | 335 | |
| Leu | Ser | Leu | Ala | Arg | Gly | Thr | Pro | Gly | Phe | Ser | Gly | Ala | Asp | Leu | Ala |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Lys | Leu | Val | Asn | Glu | Ala | Pro | Leu | Phe | Ala | Gly | Arg | Arg | Asn | Lys | Val |
| | | 355 | | | | | 360 | | | | | | 365 | | |
| Lys | Val | Asp | Gln | Ser | Asp | Leu | Lys | Thr | Pro | Lys | Thr | Lys | Ser | Ile | Trp |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Val | Arg | Asn | Ala | Ala | Val | Trp | | | | | | | | | |
| | 385 | | | | | 390 | | | | | | | | | |

<210> 1963

<211> 1176

<212> DNA

<213> Neisseria meningitidis

<400> 1963

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gtcagcggct acctgattaa gggcgagcgc accgacaaaa gcactttctt caccaacgcg 180
cctttggacg acaacctaata taaaacactg ctgcacaaaa acgtccgcgt aaaagtaacg 240
ccggaagaaa aaccgagcgc gctggctgcc ctgttttaca gcctgctgcc cgtcctgctg 300
ctgattggcg catggttcta cttcatgcgt atgcagacgg gcggcggcgg aaaaggcggc 360

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```

gcattctcat tcggtaaaag ccgcgcccgc ctgctggaca aagatgccaa caaagtgacc 420
tttgccgatg tgcgcggctg cgacgaagcc aaagaagaag tacaggaaat cgtcgattac 480
ctcaaagcgc cgaaccgcta tcaaagcctg ggcgggcgcg tgccgcgcgg catcctgctg 540
gcgggcagcc cgggtacggg taagacgctt ttggcgaaag cgattgcagg cgaagccggc 600
gtgccgttct tcagcatttc aggttccgac tttgtcgaaa tggtcgtcgg tgtcgggtcg 660
agccgcgtcc gcgatatggt cgagcaggcg aagaaaaacg cccctgcat catctttatc 720
gacgagattg acgcagtcgg ccgccaacgc ggcgcagggt tgggcggcgg caatgatgag 780
cgcgagcaaa cattaaacca attgttggtt gaaatggacg gttttgagag caatcagact 840
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cgcggcacgc cgggtttttc cggcgcggat ttggcgaaact tgggtcaacga agccgcctcg 1080
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```

<210> 1964

<211> 391

<212> PRT

<213> *Neisseria meningitidis*

<400> 1964

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Met Ala Ala Phe Asn Ala Leu Asp Gly Lys Lys Glu Asp Asn Gly Gln
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```

```

Ile Glu Tyr Ser Gln Phe Ile Gln Gln Val Asn Asn Gly Glu Val Ser
                20                      25                      30

```

```

Gly Val Asn Ile Glu Gly Ser Val Val Ser Gly Tyr Leu Ile Lys Gly
    35                      40                      45

```

```

Glu Arg Thr Asp Lys Ser Thr Phe Phe Thr Asn Ala Pro Leu Asp Asp
    50                      55                      60

```

```

Asn Leu Ile Lys Thr Leu Leu Asp Lys Asn Val Arg Val Lys Val Thr
    65                      70                      75                      80

```

```

Pro Glu Glu Lys Pro Ser Ala Leu Ala Ala Leu Phe Tyr Ser Leu Leu
                85                      90                      95

```

```

Pro Val Leu Leu Leu Ile Gly Ala Trp Phe Tyr Phe Met Arg Met Gln
    100                      105                      110

```

```

Thr Gly Gly Gly Gly Lys Gly Gly Ala Phe Ser Phe Gly Lys Ser Arg
    115                      120                      125

```

```

Ala Arg Leu Leu Asp Lys Asp Ala Asn Lys Val Thr Phe Ala Asp Val
    130                      135                      140

```

```

Ala Gly Cys Asp Glu Ala Lys Glu Glu Val Gln Glu Ile Val Asp Tyr
    145                      150                      155                      160

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```

Leu Lys Ala Pro Asn Arg Tyr Gln Ser Leu Gly Gly Arg Val Pro Arg
                165                      170                      175

```

```

Gly Ile Leu Leu Ala Gly Ser Pro Gly Thr Gly Lys Thr Leu Leu Ala
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Lys Ala Ile Ala Gly Glu Ala Gly Val Pro Phe Phe Ser Ile Ser Gly
 195 200 205
 Ser Asp Phe Val Glu Met Phe Val Gly Val Gly Ala Ser Arg Val Arg
 210 215 220
 Asp Met Phe Glu Gln Ala Lys Lys Asn Ala Pro Cys Ile Ile Phe Ile
 225 230 235 240
 Asp Glu Ile Asp Ala Val Gly Arg Gln Arg Gly Ala Gly Leu Gly Gly
 245 250 255
 Gly Asn Asp Glu Arg Glu Gln Thr Leu Asn Gln Leu Leu Val Glu Met
 260 265 270
 Asp Gly Phe Glu Ser Asn Gln Thr Val Ile Val Ile Ala Ala Thr Asn
 275 280 285
 Arg Pro Asp Val Leu Asp Pro Ala Leu Gln Arg Pro Gly Arg Phe Asp
 290 295 300
 Arg Gln Val Val Val Pro Leu Pro Asp Ile Arg Gly Arg Glu Gln Ile
 305 310 315 320
 Leu Asn Val His Ser Lys Lys Val Pro Leu Asp Glu Ser Val Asp Leu
 325 330 335
 Leu Ser Leu Ala Arg Gly Thr Pro Gly Phe Ser Gly Ala Asp Leu Ala
 340 345 350
 Asn Leu Val Asn Glu Ala Ala Leu Phe Ala Gly Arg Arg Asn Lys Val
 355 360 365
 Lys Val Asp Gln Ser Asp Leu Lys Thr Pro Lys Thr Lys Ser Ile Trp
 370 375 380
 Val Arg Asn Ala Ala Val Trp
 385 390

<210> 1965

<211> 1176

<212> DNA

<213> *Neisseria meningitidis*

<400> 1965

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 gtcagcggct acctgattaa gggcgagcgc accgacaaaa gcaccttctt caccaacgcg 180
 cctttggacg acaacctgat taaaacactg ctcgacaaaa acgtccgtgt aaaagtaacg 240
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 tttgccgatg tcgccggctg cgacgaagcc aaagaagaag tgcaggaa at cgtcgattac 480
 ctcaaagcgc cgaaccgcta tcaaagcctg ggcgggcgcg tgcgcgcgg catcctgctg 540
 gcgggcagcc cgggtacggg taagacgctt ttggcgaaag cgattgcagg cgaagccggc 600

```

gtgccgttct tcagcatttc aggttccgac tttgtcgaaa tgttcgtcgg tgtcgggtgca 660
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gacgagattg acgcagtcgg ccgccaacgc ggcgcagggt tgggcggcgg taatgatgag 780
cgcgagcaaa cattaacca attgttggtt gaaatggacg gttttgagag caatcagact 840
gtaattgtga ttgcggcaac caaccgcccc gacgtactcg atcctgcgct gcaacgcccc 900
ggccgtttcg accgccaagt ggttggtccc ctgccggaca tccgggggcg cgaacagatt 960
ttgaacgtcc actctaaaaa agtgcctttg gacaaatctg tggatttatt gtccctcgcg 1020
cgcggcacgc cgggtttttc cggcgcggat ttggcgaact tggtaacga agccgcctcg 1080
tttgccggcc gccgcaataa agtcaaagtc gatcagagcg atttgaagac gccaaagaca 1140
aaatctatat gggtcgggaa cgccgcagta tgggtga 1176

```

<210> 1966
 <211> 391
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 1966

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Ala | Phe | Asn | Ala | Leu | Asp | Gly | Lys | Lys | Glu | Asp | Asn | Gly | Gln |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| | | | | | | | | | | | | | | | |
| Ile | Glu | Tyr | Ser | Gln | Phe | Ile | Gln | Gln | Val | Asn | Asn | Gly | Glu | Val | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| | | | | | | | | | | | | | | | |
| Gly | Val | Asn | Ile | Glu | Gly | Ser | Val | Val | Ser | Gly | Tyr | Leu | Ile | Lys | Gly |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| | | | | | | | | | | | | | | | |
| Glu | Arg | Thr | Asp | Lys | Ser | Thr | Phe | Phe | Thr | Asn | Ala | Pro | Leu | Asp | Asp |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| | | | | | | | | | | | | | | | |
| Asn | Leu | Ile | Lys | Thr | Leu | Leu | Asp | Lys | Asn | Val | Arg | Val | Lys | Val | Thr |
| 65 | | | | | 70 | | | | 75 | | | | | | 80 |
| | | | | | | | | | | | | | | | |
| Pro | Glu | Glu | Lys | Pro | Ser | Ala | Leu | Ala | Ala | Leu | Phe | Tyr | Ser | Leu | Leu |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| | | | | | | | | | | | | | | | |
| Pro | Val | Leu | Leu | Leu | Ile | Gly | Ala | Trp | Phe | Tyr | Phe | Met | Arg | Met | Gln |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| | | | | | | | | | | | | | | | |
| Thr | Gly | Gly | Gly | Gly | Lys | Gly | Gly | Ala | Phe | Ser | Phe | Gly | Lys | Ser | Arg |
| | 115 | | | | | | 120 | | | | | 125 | | | |
| | | | | | | | | | | | | | | | |
| Ala | Arg | Leu | Leu | Asp | Lys | Asp | Ala | Asn | Lys | Val | Thr | Phe | Ala | Asp | Val |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| | | | | | | | | | | | | | | | |
| Ala | Gly | Cys | Asp | Glu | Ala | Lys | Glu | Glu | Val | Gln | Glu | Ile | Val | Asp | Tyr |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| | | | | | | | | | | | | | | | |
| Leu | Lys | Ala | Pro | Asn | Arg | Tyr | Gln | Ser | Leu | Gly | Gly | Arg | Val | Pro | Arg |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| | | | | | | | | | | | | | | | |
| Gly | Ile | Leu | Leu | Ala | Gly | Ser | Pro | Gly | Thr | Gly | Lys | Thr | Leu | Leu | Ala |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| | | | | | | | | | | | | | | | |
| Lys | Ala | Ile | Ala | Gly | Glu | Ala | Gly | Val | Pro | Phe | Phe | Ser | Ile | Ser | Gly |
| | | 195 | | | | | 200 | | | | | 205 | | | |

Ser Asp Phe Val Glu Met Phe Val Gly Val Gly Ala Ser Arg Val Arg
 210 215 220

Asp Met Phe Glu Gln Ala Lys Lys Asn Ala Pro Cys Ile Ile Phe Ile
 225 230 235 240

Asp Glu Ile Asp Ala Val Gly Arg Gln Arg Gly Ala Gly Leu Gly Gly
 245 250 255

Gly Asn Asp Glu Arg Glu Gln Thr Leu Asn Gln Leu Leu Val Glu Met
 260 265 270

Asp Gly Phe Glu Ser Asn Gln Thr Val Ile Val Ile Ala Ala Thr Asn
 275 280 285

Arg Pro Asp Val Leu Asp Pro Ala Leu Gln Arg Pro Gly Arg Phe Asp
 290 295 300

Arg Gln Val Val Val Pro Leu Pro Asp Ile Arg Gly Arg Glu Gln Ile
 305 310 315 320

Leu Asn Val His Ser Lys Lys Val Pro Leu Asp Lys Ser Val Asp Leu
 325 330 335

Leu Ser Leu Ala Arg Gly Thr Pro Gly Phe Ser Gly Ala Asp Leu Ala
 340 345 350

Asn Leu Val Asn Glu Ala Ala Leu Phe Ala Gly Arg Arg Asn Lys Val
 355 360 365

Lys Val Asp Gln Ser Asp Leu Lys Thr Pro Lys Thr Lys Ser Ile Trp
 370 375 380

Val Arg Asn Ala Ala Val Trp
 385 390

<210> 1967

<211> 1116

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 1967

atgtggaaac ggcggcggcg cgggtgtcggc agctttgaag agcagcgaat agatgccgcc 60
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 tcgtccagcc acgtttggca gattttggac aggcgcagga atttgccgcc gcgtgcggca 180
 agtatgtcgc gccattgtgc cacttcttcg gcggacggtg cttcgtcgat gctgcattcg 240
 tacagcagga aatcgagggt ttcttcgatg acgggatgg attccgtttg gataagctgc 300
 ttgagttcgt tcatgactgt tcggatacgg aaatcgggaa aatgccgtct gaaagggctt 360
 cagacggcat tggattattt gctgtgcagg aagcgcgttg cctcttccca tttgccggaa 420
 atgatgtcgg gtacggcctg cagggatttg gcgacggcat cgtcgatttg ccggcgggtgc 480
 ttccgcgctc ggtttgttca agacgtagcc gacgacgagg ttgcggtcgc cggggtggcc 540
 gatgccgagg cgcaggcggg aatagtctgc cgtgccgagt ttgcctgaa tgtctttcaa 600
 gccgttgtgt ccgcgcgttg cgcgcgcgag ttgaaatttg atccgtccgc aagggatgtc 660
 gagttcgtcg tggacgacga ggatttcttc gggtttgatt ttgtagaact gtgcaagcgc 720
 ggcaaccgcc tgtccggaac ggttcatgaa cgtggccggg ttgagcagcc aaacatcgcc 780

gtcgggcagg gcggcgcggg caacttcgcc gaagaatttt ttttcttctt taaacgaagc 840
 cttccatttc cagccagtt cgtcgaggaa ccaaaagccc gcattgtggc gggctctgttc 900
 gtattctttg cccgggttgc ccaagccgac aaccattttg attgtgttcg acatgatatt 960
 ttccgtgttt ctgtcgaatg cggctctgaag gcttcagacg gcatggttat tcttcttgat 1020
 tttgaacgcg tgtgcggcgc gcttcttttg ggtcgatcaa cagcgggcgg tacacttcga 1080
 tgcggtcgcc gtcgcgcagc ggcgtgtcgt ctttga 1116

<210> 1968

<211> 371

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1968

Met Trp Lys Arg Arg Arg Gly Val Gly Ser Phe Glu Glu Gln Arg
 1 5 10 15

Ile Asp Ala Ala Gly Lys Pro Gln Cys Gly Lys Gln Ala Glu Ala Val
 20 25 30

Ala Arg Gln Leu His Ala Ala Ser Ser Ser Ser His Val Trp Gln Ile
 35 40 45

Leu Asp Arg Arg Arg Asn Leu Pro Pro Arg Ala Ala Ser Met Ser Arg
 50 55 60

His Cys Ala Thr Ser Ser Ala Asp Gly Ala Ser Ser Met Leu His Ser
 65 70 75 80

Tyr Ser Arg Lys Ser Arg Val Ser Ser Met Thr Gly Met Asp Ser Val
 85 90 95

Trp Ile Ser Cys Leu Ser Ser Phe Met Thr Val Arg Ile Arg Lys Ser
 100 105 110

Gly Lys Cys Arg Leu Lys Gly Leu Gln Thr Ala Leu Asp Tyr Leu Leu
 115 120 125

Cys Arg Lys Arg Val Ala Ser Ser His Leu Pro Glu Met Met Ser Gly
 130 135 140

Thr Ala Cys Arg Asp Leu Ala Thr Ala Ser Ser Ile Cys Arg Arg Cys
 145 150 155 160

Phe Arg Ala Arg Phe Val Gln Asp Val Ala Asp Asp Glu Val Ala Val
 165 170 175

Ala Gly Val Ala Asp Ala Glu Ala Gln Ala Val Ile Val Cys Arg Ala
 180 185 190

Glu Phe Cys Leu Asn Val Phe Gln Ala Val Val Ser Ala Val Ala Ala
 195 200 205

Ala Glu Phe Glu Phe Asp Pro Ser Ala Arg Asp Val Glu Phe Val Val
 210 215 220

Asp Asp Glu Asp Phe Phe Gly Phe Asp Phe Val Glu Leu Cys Lys Arg

| | | | | | | |
|---|-----|-----|-----|-----|-----|-----|
| 225 | | 230 | | 235 | | 240 |
| Gly Asn Arg Leu Ser Gly Thr Val His Glu Arg Gly Arg Phe Glu Gln | | | | | | |
| | 245 | | | 250 | | 255 |
| Pro Asn Ile Ala Val Gly Gln Gly Gly Ala Gly Asn Phe Ala Glu Glu | | | | | | |
| | 260 | | 265 | | 270 | |
| Phe Phe Phe Phe Phe Lys Arg Ser Leu Pro Phe Pro Arg Gln Phe Val | | | | | | |
| | 275 | | 280 | | 285 | |
| Glu Glu Pro Lys Ala Arg Ile Val Ala Gly Leu Phe Val Phe Phe Ala | | | | | | |
| | 290 | | 295 | | 300 | |
| Arg Val Ala Gln Ala Asp Asn His Phe Asp Cys Val Arg His Asp Ile | | | | | | |
| 305 | | 310 | | 315 | | 320 |
| Phe Arg Val Ser Val Glu Cys Gly Leu Lys Ala Ser Asp Gly Met Val | | | | | | |
| | 325 | | 330 | | 335 | |
| Ile Leu Leu Asp Phe Glu Arg Val Cys Gly Ala Leu Leu Trp Gly Arg | | | | | | |
| | 340 | | 345 | | 350 | |
| Ser Thr Ala Gly Gly Thr Leu Arg Cys Gly Arg Arg Arg Ala Ala Ala | | | | | | |
| | 355 | | 360 | | 365 | |
| Cys Arg Leu | | | | | | |
| 370 | | | | | | |

<210> 1969
 <211> 1115
 <212> DNA
 <213> Neisseria meningitidis

<400> 1969

| | | | | | | |
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| atgcggaaaa | ggcgggtggcg | cggtttccggc | agctttgaaa | agcagtgagt | aaatgctgcc | 60 |
| tgcaaaccac | aatgccgaga | gcaggataaa | gcggttgctg | ggcagattca | tgcttggtcc | 120 |
| tcttcaagcc | atgtctggca | tagtttgat | aggcgcagga | atcttcgcc | gcgtgcggcc | 180 |
| agcatatcgc | gccaaacggc | aatttcttcg | gcggaggggg | catcgtctat | gctgcattcg | 240 |
| tagagcagga | aatcgagggt | ttcttcgatg | acggggatgg | attcggtttg | gataagctgc | 300 |
| ttgagttcgg | tcatgactgt | tcggatatgg | aaatcgggaa | catgccgtct | gaaagggtct | 360 |
| cagacggcat | cgggtcattt | gctgtgcagg | aagcgggttg | cttcttccca | tttgccggca | 420 |
| aggatgtcgg | gtatggcttg | cagggatttg | gcgacggcat | cgtcaatctg | tcggcgggtg | 480 |
| tcggtactgg | gtttgttcag | gacatagccg | acgacgaggt | tgcggtcgcc | cgggtggccg | 540 |
| atgccgaggc | gcaggcggta | atagtctgcc | gtgccgagtt | ttgcctgaat | gtctttcaag | 600 |
| ccgttggtgc | cgccgttgcc | gccgccgagt | ttgaatttga | tcggtccgca | gggaatgtcg | 660 |
| agttcgtcgt | ggacgacgag | gatttcttcg | ggtttgattt | tgtagaactg | tgcaagcgcg | 720 |
| gcaactgcct | gtccggaacg | gttcatgaac | gtggcagggt | tgagcagcca | aacgtcgcgg | 780 |
| tcgggcaggg | cggcacgggc | gaatttcgcc | aagaattttt | tttcttcttt | aaatgaagcc | 840 |
| ttccatttcc | acgccagttc | gtcgaggaac | caaaaacccg | cattgtggcg | tgtctgttcg | 900 |
| tattctttgc | ccgggttgcc | caagccgaca | accattttga | ttgtgtttga | catgatattt | 960 |
| tcggtgtttc | tgtcgaatgc | tgtctgaagg | cttcagacgg | catggttatt | cttcttgatt | 1020 |
| ttgaacgcgt | ttcggcgcg | cttctttggg | gtcgatcaac | agcgggcggg | acacttcgat | 1080 |
| gcggtcgccg | tcgcgcagcg | gcgtgtcgtc | tttga | | | 1115 |

<210> 1970

<211> 371

<212> PRT

<213> Neisseria meningitidis

<400> 1970

Met Arg Lys Arg Arg Trp Arg Gly Phe Gly Ser Phe Glu Lys Gln Xaa
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20 25 30

Ala Trp Gln Ile His Ala Cys Ser Ser Ser Ser His Val Trp His Ser
35 40 45

Leu Asp Arg Arg Arg Asn Phe Pro Pro Arg Ala Ala Ser Ile Ser Arg
50 55 60

Gln Thr Ala Ile Ser Ser Ala Glu Gly Ala Ser Ser Met Leu His Ser
65 70 75 80

Xaa Ser Arg Lys Ser Arg Val Ser Ser Met Thr Gly Met Asp Ser Val
85 90 95

Trp Ile Ser Cys Leu Ser Ser Val Met Thr Val Arg Ile Trp Lys Ser
100 105 110

Gly Thr Cys Arg Leu Lys Gly Leu Gln Thr Ala Ser Gly His Leu Leu
115 120 125

Cys Arg Lys Arg Val Ala Ser Ser His Leu Pro Ala Arg Met Ser Gly
130 135 140

Met Ala Cys Arg Asp Leu Ala Thr Ala Ser Ser Ile Cys Arg Arg Cys
145 150 155 160

Xaa Arg Thr Gly Phe Val Gln Asp Ile Ala Asp Asp Glu Val Ala Val
165 170 175

Ala Arg Val Ala Asp Ala Glu Ala Gln Ala Val Ile Val Cys Arg Ala
180 185 190

Glu Phe Cys Leu Asn Val Phe Gln Ala Val Val Ser Ala Val Ala Ala
195 200 205

Ala Glu Phe Glu Phe Asp Pro Ser Ala Gly Asn Val Glu Phe Val Val
210 215 220

Asp Asp Glu Asp Phe Phe Gly Phe Asp Phe Val Glu Leu Cys Lys Arg
225 230 235 240

Gly Asn Cys Leu Ser Gly Thr Val His Glu Arg Gly Arg Phe Glu Gln
245 250 255

Pro Asn Val Ala Val Gly Gln Gly Gly Thr Gly Asp Phe Ala Glu Glu
260 265 270

Phe Phe Phe Phe Phe Lys Xaa Ser Leu Pro Phe Pro Arg Gln Phe Val
275 280 285

Glu Glu Pro Lys Thr Arg Ile Val Ala Cys Leu Phe Val Phe Phe Ala
290 295 300

Arg Val Ala Gln Ala Asp Asn His Phe Asp Cys Val Xaa His Asp Ile
305 310 315 320

Phe Arg Val Ser Val Glu Cys Cys Leu Lys Ala Ser Asp Gly Met Val
325 330 335

Ile Leu Leu Asp Phe Glu Arg Val Cys Gly Ala Leu Leu Trp Gly Arg
340 345 350

Ser Thr Ala Gly Gly Thr Leu Arg Cys Gly Arg Arg Arg Ala Ala Ala
355 360 365

Cys Arg Leu
370

<210> 1971

<211> 1115

<212> DNA

<213> Neisseria meningitidis

<400> 1971

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tcgtccagcc acgtttggca gattttggac aggcgcagga atttgccgcc gcgtgcggca 180
agtatgtcgc gccattgtgc cacttcttcg gcggatgggt cgtcgtcgat gctgcattcg 240
tacagcagga aatcgagggt ttcttcgatg acggggatgg attcggtttg gataagctgc 300
ttgagttcgg tcatgactgt tcggatatgg aaatcgggaa catgcggtct gaaagggctt 360
cagacggcat cgggtcattt gctgtgcagg aagcgggttg cctcttcaca ttgcccgcga 420
aggatgtcgg gtatggcttg cagggatttg gcgacggcat cgtcaatctg tcggcgggtg 480
tcggtactgg gtttggtcag gacatagccg acgacgaggt tgcggtcgcc cgggtggccg 540
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gcaactgcct gtccggaacg gttcatgaac gtggtcggct tgagcagcca gacatcgccg 780
tcgggcaggg tagcacgggc gacttcgccg aagaattttt tttcttcttt aaatgaagcc 840
ttccatttcc acgccagttc gtcgaggaac caaaaaccg cattgtggcg tgtctgttcg 900
tattctttgc ccgggttgcc caagccgaca accattttga ttgtgtttga catgatattt 960
tcggtgtttc tgccgaatgc cgtctgaagg cttcagacgg catgggttatt cttcttgatt 1020
ttgaacgcgt ttgcggcgcg cttctttggg gtcgatcaac agcgggcggt acacttcgat 1080
gcggtcgccg tcgcgcagcg gcgtgtcgtc ttgta 1115

<210> 1972

<211> 369

<212> PRT

<213> Neisseria meningitidis

<400> 1972

Met Arg Lys Arg Arg Arg Arg Gly Val Gly Ser Phe Glu Glu Gln Arg
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Ile Asp Ala Ala Gly Lys Pro Gln Cys Gly Lys Gln Ala Glu Ala Val
20 25 30
Ala Arg Gln Leu His Ala Ala Ser Ser Ser Ser His Val Trp Gln Ile
35 40 45
Leu Asp Arg Arg Arg Asn Leu Pro Pro Arg Ala Ala Ser Met Ser Arg
50 55 60
His Cys Ala Thr Ser Ser Ala Asp Gly Ala Ser Ser Met Leu His Ser
65 70 75 80
Tyr Ser Arg Lys Ser Arg Val Ser Ser Met Thr Gly Met Asp Ser Val
85 90 95
Trp Ile Ser Cys Leu Ser Ser Val Met Thr Val Arg Ile Trp Lys Ser
100 105 110
Gly Thr Cys Arg Leu Lys Gly Leu Gln Thr Ala Ser Gly His Leu Leu
115 120 125
Cys Arg Lys Arg Val Ala Ser Ser His Leu Pro Ala Arg Met Ser Gly
130 135 140
Met Ala Cys Arg Asp Leu Ala Thr Ala Ser Ser Ile Cys Arg Arg Xaa
145 150 155 160
Phe Arg Thr Gly Phe Val Gln Asp Ile Ala Asp Asp Glu Val Ala Val
165 170 175
Ala Arg Val Ala Asp Ala Glu Ala Gln Ala Val Ile Val Cys Arg Ala
180 185 190
Glu Phe Cys Leu Asn Val Phe Gln Ala Val Val Ser Thr Val Ala Ala
195 200 205
Ala Glu Phe Glu Phe Asp Pro Ser Ala Gly Asn Val Glu Phe Val Val
210 215 220
Asp Asp Glu Asp Phe Phe Gly Phe Asp Phe Ile Lys Leu Arg Lys Gly
225 230 235 240
Gly Asn Cys Leu Ser Gly Thr Val His Glu Arg Gly Arg Leu Glu Gln
245 250 255
Pro Asp Ile Ala Val Gly Gln Gly Ser Thr Gly Asp Phe Ala Glu Glu
260 265 270
Phe Phe Phe Phe Phe Lys Ser Leu Pro Phe Pro Arg Gln Phe Val Glu
275 280 285
Glu Pro Lys Thr Arg Ile Val Ala Cys Leu Phe Val Phe Phe Ala Arg
290 295 300

Val Ala Gln Ala Asp Asn His Phe Asp Cys Val His Asp Ile Phe Arg
 305 310 315 320

Val Ser Ala Glu Cys Arg Leu Lys Ala Ser Asp Gly Met Val Ile Leu
 325 330 335

Leu Asp Phe Glu Arg Val Cys Gly Ala Leu Leu Trp Gly Arg Ser Thr
 340 345 350

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Leu

<210> 1973
 <211> 1206
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1973
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 ccttgccggac ggatcaaatt caaactcggc ggcggcaacg gcggacacaa cggcttgaaa 360
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 ccggcgacc gcaacctcgt cgtcggctac gtcttgaaca aaccgagcgc ggaagcaccg 480
 ccggcaaatc gacgatgccg tcgccaatc cctgcaggcc gtacccgaca tcatttcggg 540
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<210> 1974
 <211> 401
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1974
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 20 25 30

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Leu | Ala | Trp | Lys | Trp | Lys | Ala | Ser | Phe | Lys | Glu | Glu | Lys | Lys | Phe | Phe | | |
| | 35 | | | | | | 40 | | | | | 45 | | | | | |
| Gly | Glu | Val | Ala | Arg | Ala | Ala | Leu | Pro | Asp | Gly | Asp | Val | Trp | Leu | Leu | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Lys | Pro | Ala | Thr | Phe | Met | Asn | Arg | Ser | Gly | Gln | Ala | Val | Ala | Ala | Leu | | |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 | | |
| Ala | Gln | Phe | Tyr | Lys | Ile | Lys | Pro | Glu | Glu | Ile | Leu | Val | Val | His | Asp | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | |
| Glu | Leu | Asp | Ile | Pro | Cys | Gly | Arg | Ile | Lys | Phe | Lys | Leu | Gly | Gly | Gly | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| Asn | Gly | Gly | His | Asn | Gly | Leu | Lys | Asp | Ile | Gln | Ala | Lys | Leu | Gly | Thr | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Ala | Asp | Tyr | Tyr | Arg | Leu | Arg | Leu | Gly | Ile | Gly | His | Pro | Gly | Asp | Arg | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Asn | Leu | Val | Val | Gly | Tyr | Val | Leu | Asn | Lys | Pro | Ser | Ala | Glu | Ala | Pro | | |
| | 145 | | | | 150 | | | | | 155 | | | | | 160 | | |
| Pro | Ala | Asn | Arg | Arg | Cys | Arg | Arg | Gln | Ile | Pro | Ala | Gly | Arg | Thr | Arg | | |
| | | | | 165 | | | | | 170 | | | | | 175 | | | |
| His | His | Phe | Arg | Gln | Met | Gly | Arg | Gly | Asn | Ala | Leu | Pro | Ala | Gln | Gln | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| Ile | Ile | Gln | Cys | Arg | Leu | Lys | Pro | Phe | Gln | Thr | Ala | Phe | Ser | Arg | Phe | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Pro | Tyr | Pro | Asn | Ser | His | Glu | Arg | Thr | Gln | Ala | Ala | Tyr | Pro | Asn | Gly | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Ile | His | Pro | Arg | His | Arg | Arg | Asn | Pro | Arg | Phe | Pro | Ala | Val | Arg | Met | | |
| | 225 | | | | 230 | | | | | 235 | | | | | 240 | | |
| Gln | His | Arg | Arg | Ser | Thr | Val | Arg | Arg | Arg | Ser | Gly | Thr | Met | Ala | Arg | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | |
| His | Thr | Cys | Arg | Thr | Arg | Arg | Gln | Ile | Pro | Ala | Pro | Val | Gln | Asn | Leu | | |
| | | | 260 | | | | | 265 | | | | | 270 | | | | |
| Pro | Asn | Val | Ala | Gly | Arg | Gly | Gly | Gly | Met | Lys | Leu | Pro | Arg | Asn | Arg | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | |
| Phe | Ser | Leu | Leu | Ser | Ala | Leu | Trp | Phe | Ala | Gly | Gly | Ile | Tyr | Ser | Leu | | |
| | 290 | | | | | 295 | | | | | 300 | | | | | | |
| Leu | Phe | Lys | Ala | Ala | Asp | Thr | Ala | Pro | Pro | Pro | Phe | Pro | His | Phe | Asp | | |
| | 305 | | | | 310 | | | | | 315 | | | | | 320 | | |
| Lys | Ala | Ala | His | Leu | Ala | Leu | Phe | Phe | Ala | Gln | Ile | Leu | Phe | Leu | Ala | | |
| | | | | 325 | | | | | 330 | | | | | 335 | | | |

Lys Ala Phe Lys Thr Gly Lys Leu Pro Ile Pro Tyr Arg Ser Leu Ile
 340 345 350

Ala Phe Ala Phe Cys Phe Ala Val Gly Ser Glu Cys Ala Gln Ala Trp
 355 360 365

Phe Thr Ala Thr Arg Thr Gly Ser Leu Gly Asp Val Leu Ala Asp Leu
 370 375 380

Thr Gly Ala Ala Leu Ala Leu Phe Ala Ala Arg Ser Ala Cys Arg Pro
 385 390 395 400

Asp

<210> 1975

<211> 1205

<212> DNA

<213> Neisseria meningitidis

<400> 1975

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 gacattcagg caaaactcgg caccggcagac tattaccgcc tgcgcctcgg catcgccac 420
 ccgggcggacc gcaacctcgt cgtcggctat gtccgaaca aaccagtagc ggaacaccgc 480
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<210> 1976

<211> 401

<212> PRT

<213> Neisseria meningitidis

<400> 1976

Met Ser Asn Thr Ile Lys Met Val Val Gly Leu Gly Asn Pro Gly Lys
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 20 25 30

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 35 40 45
 Gly Glu Val Ala Arg Ala Ala Leu Pro Asp Gly Asp Val Trp Leu Leu
 50 55 60
 Lys Pro Ala Thr Phe Met Asn Arg Ser Gly Gln Ala Val Ala Ala Leu
 65 70 75 80
 Ala Gln Phe Tyr Lys Ile Lys Pro Glu Glu Ile Leu Val Val His Asp
 85 90 95
 Glu Leu Asp Ile Pro Cys Gly Arg Ile Lys Phe Lys Leu Gly Gly Gly
 100 105 110
 Asn Gly Gly His Asn Gly Leu Lys Asp Ile Gln Ala Lys Leu Gly Thr
 115 120 125
 Ala Asp Tyr Tyr Arg Leu Arg Leu Gly Ile Gly His Pro Gly Asp Arg
 130 135 140
 Asn Leu Val Val Gly Tyr Val Leu Asn Lys Pro Ser Thr Glu Xaa Pro
 145 150 155 160
 Pro Thr Asp Xaa Arg Cys Arg Arg Gln Ile Pro Ala Ser His Thr Arg
 165 170 175
 His Pro Cys Arg Gln Met Gly Arg Ser Asn Pro Leu Pro Ala Gln Gln
 180 185 190
 Met Thr Arg Cys Arg Leu Lys Pro Phe Gln Thr Ala Cys Ser Arg Phe
 195 200 205
 Pro Tyr Pro Asn Ser His Asp Arg Thr Gln Ala Ala Tyr Pro Asn Arg
 210 215 220
 Ile His Pro Arg His Arg Arg Asn Pro Arg Phe Pro Ala Leu Arg Met
 225 230 235 240
 Gln His Arg Arg Cys Pro Leu Arg Arg Arg Asn Cys Arg Leu Ala Arg
 245 250 255
 Tyr Ala Gly Arg Thr Arg Arg Lys Ile Pro Ala Pro Ile Gln Thr Met
 260 265 270
 Pro Asp Met Ala Xaa Arg Gly Thr Ser Met Asn Leu Pro Arg Asn Arg
 275 280 285
 Phe Ile Leu Leu Ser Ala Leu Trp Phe Ala Gly Ser Ile Tyr Ser Leu
 290 295 300
 Leu Phe Lys Ala Ala Glu Thr Ala Pro Pro Phe Pro His Phe Asp
 305 310 315 320
 Lys Val Ala His Leu Ala Leu Phe Phe Ala Gln Ile Trp Leu Leu Thr
 325 330 335

Lys Ala Phe Arg Thr Asp Asn Arg Pro Ile Pro Tyr Arg Ser Leu Met
 340 345 350

Val Phe Ala Leu Cys Phe Ala Leu Phe Ser Glu Cys Ala Gln Ala Trp
 355 360 365

Phe Thr Ala Thr Arg Thr Gly Ser Leu Gly Asp Val Leu Ala Asp Leu
 370 375 380

Thr Gly Ala Ala Leu Ala Leu Phe Thr Ala Arg Ala Ala Cys Arg Pro
 385 390 395 400

Asp

<210> 1977

<211> 1205

<212> DNA

<213> Neisseria meningitidis

<400> 1977

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gtctggctgc tcaagccgac cacgttcatg aaccgttccg gacaggcagt tgcgccctt 240
gcgcagtttt ataaaatcaa acccgaagaa atcctcgctg tccacgacga actcgacatt 300
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cgacagattg acgatgccgt cgccaaatcc ctgcaagcca taccgacat ccttgccggc 540
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<210> 1978

<211> 398

<212> PRT

<213> Neisseria meningitidis

<400> 1978

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 20 25 30

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 35 40 45
 Gly Glu Val Ala Arg Ala Thr Leu Pro Asp Gly Asp Val Trp Leu Leu
 50 55 60
 Lys Pro Thr Thr Phe Met Asn Arg Ser Gly Gln Ala Val Ala Ala Leu
 65 70 75 80
 Ala Gln Phe Tyr Lys Ile Lys Pro Glu Glu Ile Leu Val Val His Asp
 85 90 95
 Glu Leu Asp Ile Pro Cys Gly Arg Ile Lys Phe Lys Leu Gly Gly Gly
 100 105 110
 Asn Gly Gly His Asn Gly Leu Lys Asp Ile Gln Ala Lys Leu Gly Thr
 115 120 125
 Ala Asp Tyr Tyr Arg Leu Arg Leu Gly Ile Gly His Pro Gly Asp Arg
 130 135 140
 Asn Leu Val Val Gly Tyr Val Leu Asn Lys Pro Ser Thr Glu Xaa Pro
 145 150 155 160
 Pro Thr Asp Arg Cys Arg Arg Gln Ile Pro Ala Ser His Thr Arg His
 165 170 175
 Pro Cys Arg Gln Met Arg Gly Asn Pro Leu Pro Ala Gln Gln Met Thr
 180 185 190
 Arg Cys Arg Leu Lys Pro Phe Gln Thr Ala Cys Ser Arg Phe Pro Tyr
 195 200 205
 Pro Asn Ser His Asp Arg Thr Gln Ala Ala Tyr Pro Asn Arg Ile His
 210 215 220
 Pro Arg His Arg Arg Asn Pro Arg Phe Pro Ala Val Arg Met Gln His
 225 230 235 240
 Arg Arg Arg Thr Ile Arg Arg Arg Ser Gly Thr Met Ala Arg His Thr
 245 250 255
 Cys Arg Thr Arg Arg Gln Ile Pro Ala Pro Val Gln Asn Leu Pro Asn
 260 265 270
 Val Ala Gly Arg Gly Gly Gly Met Lys Leu Pro Arg Asn Arg Phe Ser
 275 280 285
 Leu Leu Ser Ala Leu Trp Phe Ala Gly Gly Ile Tyr Ser Leu Leu Phe
 290 295 300
 Lys Ala Ala Asp Thr Ala Pro Pro Pro Phe Pro His Phe Asp Lys Ala
 305 310 315 320
 Ala His Leu Ala Leu Phe Phe Ala Gln Ile Trp Leu Leu Thr Lys Ala
 325 330 335

Phe Lys Thr Gly Lys Leu Pro Ile Pro Tyr Arg Ser Leu Met Val Phe
 340 345 350

Ala Leu Cys Phe Ala Leu Phe Ser Glu Cys Ala Gln Ala Phe Thr Ala
 355 360 365

Thr Arg Thr Gly Ser Leu Gly Asp Val Leu Ala Asp Met Ala Gly Thr
 370 375 380

Val Leu Ala Leu Phe Ala Ala Arg Ala Ala Asp Arg Pro Asp
 385 390 395

<210> 1979

<211> 975

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1979

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<210> 1980

<211> 324

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1980

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 20 25 30

Thr Leu Asn Val Lys Gly Asp Trp Asp Phe Val Leu His Leu Arg Leu
 35 40 45

Thr Lys Leu Ala Ala Leu Leu Met Val Ala Tyr Ala Val Gly Val Ser
 50 55 60

Thr Gln Leu Phe Gln Thr Leu Thr Asn Asn Pro Ile Leu Thr Pro Ser
 65 70 75 80
 Ile Leu Gly Phe Asp Ser Leu Tyr Val Phe Leu Gln Thr Leu Leu Val
 85 90 95
 Phe Thr Phe Gly Gly Val Gly Tyr Thr Ser Leu Pro Leu Thr Gly Lys
 100 105 110
 Phe Gly Phe Glu Leu Val Val Met Met Gly Gly Ser Leu Leu Leu Phe
 115 120 125
 Tyr Thr Leu Ile Arg Gln Gly Gly Arg Asp Leu Pro His Met Ile Leu
 130 135 140
 Ile Gly Val Ile Phe Gly Ile Leu Phe Arg Ser Leu Ser Ser Leu Leu
 145 150 155 160
 Ser Arg Met Ile Asp Pro Glu Glu Phe Thr Ala Ala Gln Ala Asn Met
 165 170 175
 Phe Ala Gly Phe Asn Thr Val Arg Ser Glu Leu Leu Gly Ile Gly Ala
 180 185 190
 Leu Val Leu Leu Val Ser Ala Ala Val Val Trp His Glu Arg Tyr Arg
 195 200 205
 Ser Asp Val His Leu Leu Gly Arg Asp Gln Ala Val Asn Leu Gly Ile
 210 215 220
 Ser Tyr Thr Arg Asn Thr Leu Trp Ile Leu Leu Trp Ile Ala Ala Leu
 225 230 235 240
 Val Ala Thr Ala Thr Ala Val Val Gly Pro Val Ser Phe Phe Gly Leu
 245 250 255
 Leu Ala Ala Ser Leu Ala Asn His Phe Ser Pro Ser Val Arg His Ser
 260 265 270
 Val Arg Leu Pro Met Thr Val Cys Val Gly Gly Ile Leu Leu Val Gly
 275 280 285
 Gly Gln Thr Val Phe Glu His Phe Leu Gly Met Lys Ala Val Leu Ser
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 Lys His Lys Lys

<210> 1981

<211> 975

<212> DNA

<213> Neisseria meningitidis

<400> 1981

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<210> 1982

<211> 324

<212> PRT

<213> *Neisseria meningitidis*

<400> 1982

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Thr Leu Asn Val Lys Gly Asp Trp Asp Phe Val Leu Gln Leu Arg Leu
 35          40          45

Thr Lys Leu Ala Ala Leu Leu Met Val Ala Tyr Ala Val Gly Val Ser
 50          55          60

Thr Gln Leu Phe Gln Thr Leu Thr Asn Asn Pro Ile Leu Thr Pro Ser
 65          70          75          80

Ile Leu Gly Phe Asp Ser Leu Tyr Val Phe Leu Gln Thr Leu Leu Val
      85          90          95

Phe Thr Phe Gly Gly Val Gly Tyr Ala Ser Leu Pro Leu Thr Gly Lys
 100          105          110

Phe Gly Phe Glu Leu Val Val Met Met Gly Gly Ser Leu Leu Leu Phe
 115          120          125

Tyr Thr Leu Ile Lys Gln Gly Gly Arg Asp Leu Ser Arg Met Ile Leu
 130          135          140

Ile Gly Val Ile Phe Gly Ile Leu Phe Arg Ser Leu Ser Ser Leu Leu
 145          150          155          160
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Ser Arg Met Ile Asp Pro Glu Glu Phe Thr Ala Ala Gln Ala Asn Met
 165 170 175
 Phe Ala Gly Phe Asn Thr Val His Ser Glu Leu Leu Gly Ile Gly Ala
 180 185 190
 Leu Ile Leu Leu Val Ser Ala Ala Val Val Trp Arg Glu Arg Tyr Arg
 195 200 205
 Leu Asp Val Tyr Leu Leu Gly Arg Asp Gln Ala Val Asn Leu Gly Ile
 210 215 220
 Ser Tyr Thr Arg Asn Thr Leu Trp Ile Leu Leu Trp Ile Ala Ala Leu
 225 230 235 240
 Val Ala Thr Ala Thr Ala Val Val Gly Pro Val Ser Phe Phe Gly Leu
 245 250 255
 Leu Ala Ala Ser Leu Ala Asn His Phe Ser Pro Ser Val Lys His Ser
 260 265 270
 Val Arg Leu Pro Met Thr Val Cys Ile Gly Gly Ile Leu Leu Val Gly
 275 280 285
 Gly Gln Thr Val Phe Glu His Leu Leu Gly Met Gln Ala Val Leu Ser
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 305 310 315 320
 Lys His Lys Lys

<210> 1983
 <211> 975
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 1983
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 gtcggcggtt cgacccagct ttttcaaacg ctgaccaaca atccgattct gaccccttcg 240
 attttgggtt tcgattcgct gtatgtgttt ttgcagacct tgctggtggt tacgttcggc 300
 ggcgtgggct atgcttccct gccgttgacg ggcaaattcg gctttgaact ggtcgttatg 360
 atgggcggct cgctgctgct gttttacacg ctcacaaac agggcgggcg cgatttgccg 420
 cgtatgattt taatcgcgct gattttcggg attttgttcc gcagcctgtc gtcgctgctt 480
 tcgcgcgatga tcgaccccgga agaatttacg gcggcgagc cgaatatggt tgccggattc 540
 aataccgtcc acagcgagct tttaggcata ggcgcgctga ttctgctcgt cagcgcgggc 600
 gtcgtttggc gcgaacgcta ccgcttgac gtacaccttt tggggcgcg ccaagccata 660
 aatttgggca tcagctacac gcgcaacacc ttatggatac tgctttggat tgccgcgctg 720
 gtggcgacgg cgaccgcgct tgtcggcccc gtaagctttt tcgggcttct cgccgcctcg 780
 cttgcccaacc acttttcccc gtcgggtcaa cattccgtcc gcctgccgat gacggtttgt 840
 gtcggcggca tcctcttggt cggcgacag accgtattcg aacacttctt gggcatgaag 900
 gcggtattaa gcgtggtggt cgaatttgcg ggcggactcg ttttcctcta tctcgtttta 960
 agacacaaaa aatga 975

<210> 1984
 <211> 324
 <212> PRT
 <213> Neisseria meningitidis

<400> 1984

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Pro | Ser | Glu | Lys | Asn | Ile | Gly | Phe | Met | Ala | Gly | Ser | Ser | Arg | Pro |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Leu | Trp | Val | Ala | Phe | Ala | Leu | Leu | Leu | Val | Ser | Cys | Ile | Leu | Phe | Met |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Thr | Leu | Asn | Val | Lys | Gly | Asp | Trp | Asp | Phe | Val | Leu | His | Leu | Arg | Leu |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Thr | Lys | Leu | Ala | Ala | Leu | Leu | Met | Val | Ala | Tyr | Ala | Val | Gly | Val | Ser |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Thr | Gln | Leu | Phe | Gln | Thr | Leu | Thr | Asn | Asn | Pro | Ile | Leu | Thr | Pro | Ser |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 |
| Ile | Leu | Gly | Phe | Asp | Ser | Leu | Tyr | Val | Phe | Leu | Gln | Thr | Leu | Leu | Val |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Phe | Thr | Phe | Gly | Gly | Val | Gly | Tyr | Ala | Ser | Leu | Pro | Leu | Thr | Gly | Lys |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Phe | Gly | Phe | Glu | Leu | Val | Val | Met | Met | Gly | Gly | Ser | Leu | Leu | Leu | Phe |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Tyr | Thr | Leu | Ile | Lys | Gln | Gly | Gly | Arg | Asp | Leu | Pro | Arg | Met | Ile | Leu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Ile | Gly | Val | Ile | Phe | Gly | Ile | Leu | Phe | Arg | Ser | Leu | Ser | Ser | Leu | Leu |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Ser | Arg | Met | Ile | Asp | Pro | Glu | Glu | Phe | Thr | Ala | Ala | Gln | Ala | Asn | Met |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Phe | Ala | Gly | Phe | Asn | Thr | Val | His | Ser | Glu | Leu | Leu | Gly | Ile | Gly | Ala |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Leu | Ile | Leu | Leu | Val | Ser | Ala | Ala | Val | Val | Trp | Arg | Glu | Arg | Tyr | Arg |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Leu | Asp | Val | His | Leu | Leu | Gly | Arg | Asp | Gln | Ala | Ile | Asn | Leu | Gly | Ile |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Ser | Tyr | Thr | Arg | Asn | Thr | Leu | Trp | Ile | Leu | Leu | Trp | Ile | Ala | Ala | Leu |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Val | Ala | Thr | Ala | Thr | Ala | Val | Val | Gly | Pro | Val | Ser | Phe | Phe | Gly | Leu |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Leu | Ala | Ala | Ser | Leu | Ala | Asn | His | Phe | Ser | Pro | Ser | Val | Lys | His | Ser |

260 265 270

Val Arg Leu Pro Met Thr Val Cys Val Gly Gly Ile Leu Leu Val Gly
275 280 285

Gly Gln Thr Val Phe Glu His Phe Leu Gly Met Lys Ala Val Leu Ser
290 295 300

Val Val Val Glu Phe Ala Gly Gly Leu Val Phe Leu Tyr Leu Val Leu
305 310 315 320

Arg His Lys Lys

<210> 1985
<211> 495
<212> DNA
<213> Neisseria gonorrhoeae

<400> 1985
atgaagaaaa ccctgttggc aattgttgcc gttttcgccct taagtgcctg ccggcaggcg 60
gaagaggcac cgccgccttt accccggcag attagcgacc gttcggctcg acactattgc 120
agtatgaacc tgaccgaaca caacggcccc aaagcccaga tttttttgaa cggcaaacc 180
gatcagcccc tttggttctc caccgtcaag cagatgttcg gctataccaa gctgccccgaa 240
gagcccaaag gcatccgcgt gatttacgtt accgatatgg gcaatgttac cgattggacg 300
aatcctaatt ccgacacgga gtggatagat gcgaaaaaag ccttttacgt catcgacagc 360
ggcttttatcg gcggtatggg cgcggaagac gcgctgccgt tcggcaacaa ggagcaggct 420
gaaaaatttg caaaggataa aggcggcaag gtcgtcgggt ttgacgatat gcccgatgct 480
tacattttca agtaa 495

<210> 1986
<211> 164
<212> PRT
<213> Neisseria gonorrhoeae

<400> 1986
Met Lys Lys Thr Leu Leu Ala Ile Val Ala Val Phe Ala Leu Ser Ala
1 5 10 15

Cys Arg Gln Ala Glu Glu Ala Pro Pro Pro Leu Pro Arg Gln Ile Ser
20 25 30

Asp Arg Ser Val Gly His Tyr Cys Ser Met Asn Leu Thr Glu His Asn
35 40 45

Gly Pro Lys Ala Gln Ile Phe Leu Asn Gly Lys Pro Asp Gln Pro Val
50 55 60

Trp Phe Ser Thr Val Lys Gln Met Phe Gly Tyr Thr Lys Leu Pro Glu
65 70 75 80

Glu Pro Lys Gly Ile Arg Val Ile Tyr Val Thr Asp Met Gly Asn Val
85 90 95

Thr Asp Trp Thr Asn Pro Asn Ala Asp Thr Glu Trp Ile Asp Ala Lys
100 105 110

Lys Ala Phe Tyr Val Ile Asp Ser Gly Phe Ile Gly Gly Met Gly Ala
115 120 125

Glu Asp Ala Leu Pro Phe Gly Asn Lys Glu Gln Ala Glu Lys Phe Ala
130 135 140

Lys Asp Lys Gly Gly Lys Val Val Gly Phe Asp Asp Met Pro Asp Ala
145 150 155 160

Tyr Ile Phe Lys

<210> 1987
<211> 495
<212> DNA
<213> Neisseria meningitidis

<400> 1987
atgaaaaaaa ccctgttggc aattgttgcc gtttccgcct taagtgcctg ccggcaggcg 60
gaagagggac cgccgccttt accccggcag attagcgacc gttcggtcgg acactattgc 120
agtatgaacc tgaccgaaca caacggcccc aaagcccaga ttttcttgaa cggcaaaacc 180
gatcagcccc tttggttctc caccatcaag cagatgttcg gctataccaa gctgcccga 240
gagcctaaag gcatccgcgt gatttacgtt accgatatgg gcaatgttac cgattggacg 300
aatcccaatg ccgacacgga gtggatggat gcgaaaaaag ccttttacgt catcgacagc 360
ggctttatcg gcggtatggg tgcggaagac gcgctgccgt tcggcaacaa agagcaggct 420
gagaaatttg caaaggataa aggcggtaag gttgtcgggt tcgacgatat gcctgatacc 480
tatattttca aataa 495

<210> 1988
<211> 164
<212> PRT
<213> Neisseria meningitidis

<400> 1988
Met Lys Lys Thr Leu Leu Ala Ile Val Ala Val Ser Ala Leu Ser Ala
1 5 10 15

Cys Arg Gln Ala Glu Glu Gly Pro Pro Pro Leu Pro Arg Gln Ile Ser
20 25 30

Asp Arg Ser Val Gly His Tyr Cys Ser Met Asn Leu Thr Glu His Asn
35 40 45

Gly Pro Lys Ala Gln Ile Phe Leu Asn Gly Lys Pro Asp Gln Pro Val
50 55 60

Trp Phe Ser Thr Ile Lys Gln Met Phe Gly Tyr Thr Lys Leu Pro Glu
65 70 75 80

Glu Pro Lys Gly Ile Arg Val Ile Tyr Val Thr Asp Met Gly Asn Val
85 90 95

Thr Asp Trp Thr Asn Pro Asn Ala Asp Thr Glu Trp Met Asp Ala Lys
 100 105 110
 Lys Ala Phe Tyr Val Ile Asp Ser Gly Phe Ile Gly Gly Met Gly Ala
 115 120 125
 Glu Asp Ala Leu Pro Phe Gly Asn Lys Glu Gln Ala Glu Lys Phe Ala
 130 135 140
 Lys Asp Lys Gly Gly Lys Val Val Gly Phe Asp Asp Met Pro Asp Thr
 145 150 155 160
 Tyr Ile Phe Lys

<210> 1989
 <211> 495
 <212> DNA
 <213> Neisseria meningitidis

<400> 1989
 atgaaaaaaaa ccctgttgcc aattgttgcc gtttccgcct taagtgcctg ccggcaggcg 60
 gaagagggac cgccgccttt accccggcag attagcgacc gttcggtcgg acactattgc 120
 agtatgaacc tgaccgaaca caacggcccc aaagcccaga ttttcttgaa cggcaaacc 180
 gatcagcccg tttggttctc caccatcaag cagatgttcg gctataccaa gctgcccga 240
 gagcctaaag gcatccgcgt gatttacgtt accgatatgg gcaatgttac cgattggacg 300
 aatcccaatg ccgacacgga gtggatggat gcgaaaaaag ccttttacgt catcgacagc 360
 ggctttatcg gcggtatggg tgcggaagac gcgctgccgt tcggcaacaa agagcaggct 420
 gagaaatttg caaaggataa aggcggtaa gttgtcgggt tcgacgatat gcctgatacc 480
 tatattttca aataa 495

<210> 1990
 <211> 164
 <212> PRT
 <213> Neisseria meningitidis

<400> 1990
 Met Lys Lys Thr Leu Leu Ala Ile Val Ala Val Ser Ala Leu Ser Ala
 1 5 10 15
 Cys Arg Gln Ala Glu Glu Gly Pro Pro Pro Leu Pro Arg Gln Ile Ser
 20 25 30
 Asp Arg Ser Val Gly His Tyr Cys Ser Met Asn Leu Thr Glu His Asn
 35 40 45
 Gly Pro Lys Ala Gln Ile Phe Leu Asn Gly Lys Pro Asp Gln Pro Val
 50 55 60
 Trp Phe Ser Thr Ile Lys Gln Met Phe Gly Tyr Thr Lys Leu Pro Glu
 65 70 75 80
 Glu Pro Lys Gly Ile Arg Val Ile Tyr Val Thr Asp Met Gly Asn Val
 85 90 95

Thr Asp Trp Thr Asn Pro Asn Ala Asp Thr Glu Trp Met Asp Ala Lys
 100 105 110
 Lys Ala Phe Tyr Val Ile Asp Ser Gly Phe Ile Gly Gly Met Gly Ala
 115 120 125
 Glu Asp Ala Leu Pro Phe Gly Asn Lys Glu Gln Ala Glu Lys Phe Ala
 130 135 140
 Lys Asp Lys Gly Gly Lys Val Val Gly Phe Asp Asp Met Pro Asp Thr
 145 150 155 160
 Tyr Ile Phe Lys

<210> 1991
 <211> 1248
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 1991
 atgcaactta ccgctgtcgg actcaatcat caaaccgcac ctttaagcat acgggaaaag 60
 ctggcgtttg ccgccgccgc cctgccagaa gccgtccgca atcttgcccg aagcaatgcg 120
 gcaacggagg cggtaatcct ttctacctgc aaccgcaccg agctttactg cgtcggcgat 180
 tcggaagaaa tcatccgatg gcttgccgat taccacagtt tgccgattga agaaatccgt 240
 ccgtatctgt acacgctgga tatgcaggaa accgtgcgcc acgccttccg cgttgccctgc 300
 ggcttggatt cgatggtttt gggcgagccg cagattttgg ggcagattaa agatgcggtg 360
 cgtgcggctc aagaacagga aagtatgggg gcaaaactca atgccctggt ccaaaaaacc 420
 tttccggttg ctaaagaagt ccgtaccgat accgctgtcg gcgaaaattc ggtttcgatg 480
 gcttccgcgt ccgtcaagtt ggcggaacag atttttcccg acatcggcga tttgaacgta 540
 ttgtttatcg gcgcaggcga aatgattgag ctggttgcca cttattttgc cgccaaaaat 600
 ccccgctga tgacggttgc caaccggacg ctggcgcgctg cacaggagtt gtgcgacaag 660
 ctcggtgtta acgcggaacc gtgectgctg tccgatctgc ctgccattct gcacgattac 720
 gacgtggttg tttcttcaac ggcgagccag cttccgatag tcggcaaagg catggtcgaa 780
 cgcgcatgga aacagcgtca gagtatgccg ttgttcatgc ttgacttggc cgtgccgcgc 840
 gatattgaag cggaagtcgg cgatttgaac gatgcgtatc tttatacggg ggacgatatg 900
 gtcaacatcg tccaaagcgg caaggaggca aggcagaaag ccgccgccgc cgccgaaacg 960
 ctggtgtccg aaaaggttgc cgaatttgtc aggcagcagc agggcaggca gagcgttccg 1020
 ctgattaagg ccttgcgagg cgagggcgag aaagcgcgca agcaggtgtt ggaaaatgcg 1080
 atgaaacagc ttgccaaagg cgcaacggcg gaagaggttt tggaacggct gtccgtccaa 1140
 ctgaccaaca agctgctgca ttcgccaact caaaccttga ataaggcggg ggaagaagat 1200
 aaagatttgg ttcatgccgt cgcgcagatt tatcatttgg acaaataa 1248

<210> 1992
 <211> 415
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 1992
 Met Gln Leu Thr Ala Val Gly Leu Asn His Gln Thr Ala Pro Leu Ser
 1 5 10 15
 Ile Arg Glu Lys Leu Ala Phe Ala Ala Ala Leu Pro Glu Ala Val
 20 25 30

Arg Asn Leu Ala Arg Ser Asn Ala Ala Thr Glu Ala Val Ile Leu Ser
 35 40 45
 Thr Cys Asn Arg Thr Glu Leu Tyr Cys Val Gly Asp Ser Glu Glu Ile
 50 55 60
 Ile Arg Trp Leu Ala Asp Tyr His Ser Leu Pro Ile Glu Glu Ile Arg
 65 70 75 80
 Pro Tyr Leu Tyr Thr Leu Asp Met Gln Glu Thr Val Arg His Ala Phe
 85 90 95
 Arg Val Ala Cys Gly Leu Asp Ser Met Val Leu Gly Glu Pro Gln Ile
 100 105 110
 Leu Gly Gln Ile Lys Asp Ala Val Arg Ala Ala Gln Glu Gln Glu Ser
 115 120 125
 Met Gly Ala Lys Leu Asn Ala Leu Phe Gln Lys Thr Phe Ser Val Ala
 130 135 140
 Lys Glu Val Arg Thr Asp Thr Ala Val Gly Glu Asn Ser Val Ser Met
 145 150 155 160
 Ala Ser Ala Ser Val Lys Leu Ala Glu Gln Ile Phe Pro Asp Ile Gly
 165 170 175
 Asp Leu Asn Val Leu Phe Ile Gly Ala Gly Glu Met Ile Glu Leu Val
 180 185 190
 Ala Thr Tyr Phe Ala Ala Lys Asn Pro Arg Leu Met Thr Val Ala Asn
 195 200 205
 Arg Thr Leu Ala Arg Ala Gln Glu Leu Cys Asp Lys Leu Gly Val Asn
 210 215 220
 Ala Glu Pro Cys Leu Leu Ser Asp Leu Pro Ala Ile Leu His Asp Tyr
 225 230 235 240
 Asp Val Val Val Ser Ser Thr Ala Ser Gln Leu Pro Ile Val Gly Lys
 245 250 255
 Gly Met Val Glu Arg Ala Leu Lys Gln Arg Gln Ser Met Pro Leu Phe
 260 265 270
 Met Leu Asp Leu Ala Val Pro Arg Asp Ile Glu Ala Glu Val Gly Asp
 275 280 285
 Leu Asn Asp Ala Tyr Leu Tyr Thr Val Asp Asp Met Val Asn Ile Val
 290 295 300
 Gln Ser Gly Lys Glu Ala Arg Gln Lys Ala Ala Ala Ala Glu Thr
 305 310 315 320
 Leu Val Ser Glu Lys Val Ala Glu Phe Val Arg Gln Gln Gln Gly Arg
 325 330 335

Gln Ser Val Pro Leu Ile Lys Ala Leu Arg Asp Glu Gly Glu Lys Ala
340 345 350

Arg Lys Gln Val Leu Glu Asn Ala Met Lys Gln Leu Ala Lys Gly Ala
355 360 365

Thr Ala Glu Glu Val Leu Glu Arg Leu Ser Val Gln Leu Thr Asn Lys
370 375 380

Leu Leu His Ser Pro Thr Gln Thr Leu Asn Lys Ala Gly Glu Glu Asp
385 390 395 400

Lys Asp Leu Val His Ala Val Ala Gln Ile Tyr His Leu Asp Lys
405 410 415

<210> 1993
<211> 1248
<212> DNA
<213> Neisseria meningitidis

<400> 1993
atgcaactta ccgctgtcgg actcaatcat caaacccgcac ctttaagcat acgggaaaag 60
ctggcgtttg ccgccgccgc cctgcctaaa gccgtccgca atcttgcccg aagcaatgcg 120
gcaacggagg ccgtaatcct ttctacctgc aaccgcaccg agctttactg cgtcggatgat 180
tcggaagaaa tcatccgatg gcttgccgat taccacagtt tgccgattga agaaatccgt 240
ccgtatctgt acgcgctgga tatgcaggag actgtgcgcc atgctttccg cgtcgcctgc 300
gggctggatt cgatgggtgtt gggcgagccg cagatttttag gacagattaa ggatgccgtt 360
agggttgctc aagagcagga aagtatgggt aagaaactca atgccctggt ccaaaaaacc 420
ttttccggtt ctaaaagagt ccgtaccgat actgccgtcg gcgaaaactc ggtttccatg 480
gcttccggtt ccgtcaaatt ggcggaacag atttttcccg acatcggcga tttgaatgtc 540
ttgtttatcg gcgcaggcga aatgattgag ctggttgcca cttattttgc cgccaaaagt 600
ccccggtga tgacgggttc caaccggacg ctggcgcggtg cacaggagtt gtgcgacaag 660
ctcgggtgtca acgccgaacc gtgcctgtctg tccgatctgc ctgccattct gcacgattac 720
gacgtagtgg tttcttcaac ggcaagccag ttgccattg tcggcaaagg catggtggag 780
cgtgcattga aacaaaggca gagtatgccg ttgttcatgc ttgatttggc agtgccgcgt 840
gacattgaag cggaagtcgg cgatttgaat gatgcctatc ttatatacgtt ggacgatatg 900
gtcaatatcg tccaaagcgg caaggaggca aggcagaagg ccgccgccgc cgccgaaacg 960
ctggtgtccg agaaagttgc cgaatttgtc aggcagcagc agggcaggca gagtgtcccc 1020
ttgattaagg cgttgcgagg cgagggcgag aaagcgcgca aacagggtgtt ggaaaatgcc 1080
atgaaacagc ttgccaaagg cgcaacggca gaagaggttt tggaacggct gtccgtccaa 1140
ctgaccaaca agctgctgca ttcgccgacc caaaccttga ataaggcggg ggaagaagat 1200
aaagatttgg ttcatgccgt cgcgcagatt tatcatttgg acaaataa 1248

<210> 1994
<211> 415
<212> PRT
<213> Neisseria meningitidis

<400> 1994
Met Gln Leu Thr Ala Val Gly Leu Asn His Gln Thr Ala Pro Leu Ser
1 5 10 15

Ile Arg Glu Lys Leu Ala Phe Ala Ala Ala Leu Pro Lys Ala Val
20 25 30

Arg Asn Leu Ala Arg Ser Asn Ala Ala Thr Glu Ala Val Ile Leu Ser
 35 40 45
 Thr Cys Asn Arg Thr Glu Leu Tyr Cys Val Gly Asp Ser Glu Glu Ile
 50 55 60
 Ile Arg Trp Leu Ala Asp Tyr His Ser Leu Pro Ile Glu Glu Ile Arg
 65 70 75 80
 Pro Tyr Leu Tyr Ala Leu Asp Met Gln Glu Thr Val Arg His Ala Phe
 85 90 95
 Arg Val Ala Cys Gly Leu Asp Ser Met Val Leu Gly Glu Pro Gln Ile
 100 105 110
 Leu Gly Gln Ile Lys Asp Ala Val Arg Val Ala Gln Glu Gln Glu Ser
 115 120 125
 Met Gly Lys Lys Leu Asn Ala Leu Phe Gln Lys Thr Phe Ser Val Ala
 130 135 140
 Lys Glu Val Arg Thr Asp Thr Ala Val Gly Glu Asn Ser Val Ser Met
 145 150 155 160
 Ala Ser Ala Ser Val Lys Leu Ala Glu Gln Ile Phe Pro Asp Ile Gly
 165 170 175
 Asp Leu Asn Val Leu Phe Ile Gly Ala Gly Glu Met Ile Glu Leu Val
 180 185 190
 Ala Thr Tyr Phe Ala Ala Lys Ser Pro Arg Leu Met Thr Val Ala Asn
 195 200 205
 Arg Thr Leu Ala Arg Ala Gln Glu Leu Cys Asp Lys Leu Gly Val Asn
 210 215 220
 Ala Glu Pro Cys Leu Leu Ser Asp Leu Pro Ala Ile Leu His Asp Tyr
 225 230 235 240
 Asp Val Val Val Ser Ser Thr Ala Ser Gln Leu Pro Ile Val Gly Lys
 245 250 255
 Gly Met Val Glu Arg Ala Leu Lys Gln Arg Gln Ser Met Pro Leu Phe
 260 265 270
 Met Leu Asp Leu Ala Val Pro Arg Asp Ile Glu Ala Glu Val Gly Asp
 275 280 285
 Leu Asn Asp Ala Tyr Leu Tyr Thr Val Asp Asp Met Val Asn Ile Val
 290 295 300
 Gln Ser Gly Lys Glu Ala Arg Gln Lys Ala Ala Ala Ala Glu Thr
 305 310 315 320
 Leu Val Ser Glu Lys Val Ala Glu Phe Val Arg Gln Gln Gln Gly Arg
 325 330 335

Gln Ser Val Pro Leu Ile Lys Ala Leu Arg Asp Glu Gly Glu Lys Ala
340 345 350

Arg Lys Gln Val Leu Glu Asn Ala Met Lys Gln Leu Ala Lys Gly Ala
355 360 365

Thr Ala Glu Glu Val Leu Glu Arg Leu Ser Val Gln Leu Thr Asn Lys
370 375 380

Leu Leu His Ser Pro Thr Gln Thr Leu Asn Lys Ala Gly Glu Glu Asp
385 390 395 400

Lys Asp Leu Val His Ala Val Ala Gln Ile Tyr His Leu Asp Lys
405 410 415

<210> 1995
<211> 1248
<212> DNA
<213> Neisseria meningitidis

<400> 1995
atgcaactta ccgctgtcgg actcaatcat caaaccgcac ctttaagcat acgggaaaag 60
ctggcgtttg ccgcggcctg cctgcccga gccgtccgca atcttgcccg aagcaatgcg 120
gcaacggagg ccgtaatcct ttctacctgc aaccgtaccg agctttactg tgtaggatgat 180
tcggaagaaa tcatccgttg gctcgcagac tatcacagcc ttcccataga agaaatcagc 240
ccctaccttt ataactttggg gatgcaggag actgtgcgcc atgctttccg cgtcgcctgc 300
ggcttggtt cgatggtgtt gggcgagccg cagatttttag gacagattaa ggatgcggtc 360
agggttgctc aagagcagga aagtatgggt aagaaactca atgccctgtt ccaaaaaacc 420
ttttctgttg ctaaaagagt ccgtaccgat actgccgtcg gcgaaaactc gggtttccatg 480
gcttccgctt ccgtcaagtt ggcagagcag attttcccg acatcggcga tttgaatgtc 540
ttgtttatcg gtgcgggtga gatgattgag ctggttgcca cttattttgc cgccaaaagt 600
ccccggctga tgacgggttc caaccggacg ctggcgcggtg cacaggagtt gtgcgacaag 660
ctcgggtgtca acgcggaacc gtgcctgctg tccgatctgc ctgccatttt gcatgagtac 720
gacgtggttg tttcttcaac ggcaagccag ttgccattg tcggcaaagg tatggtggag 780
cgcgcatgga aacaaaggca gagtatgccg ttgtttatgc ttgacttggc cgtgccgcga 840
gacattgagg cggaagtcgg agatttgaac gatgcctatc ttatatacgtt ggacgatatg 900
gtcaatatcg tccaaagcgg caaggaggca aggcagaagg ccgccgccgc cgccgaaacg 960
ctggtgtccg agaaggttgc cgaatttgtc aggcagcagc agggcaggca gagtgtcccg 1020
ttaatcaggg cattgagggg tgagggagag aaagcgcgca aacaggctctt ggaaaatgcg 1080
atgaaacagc ttgccaaagg cgcaacggca gaagaggttt tggaaaggct gtcgatccaa 1140
ctgaccaaca agctgctgca ttcgccgacc caaaccttga ataaggcggg ggaagaagat 1200
aaagatttgg ttcacgccgt cgcgcagatt tatcatttgg acaaataa 1248

<210> 1996
<211> 415
<212> PRT
<213> Neisseria meningitidis

<400> 1996
Met Gln Leu Thr Ala Val Gly Leu Asn His Gln Thr Ala Pro Leu Ser
1 5 10 15

Ile Arg Glu Lys Leu Ala Phe Ala Ala Cys Leu Pro Glu Ala Val
20 25 30

| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Asn | Leu | Ala | Arg | Ser | Asn | Ala | Ala | Thr | Glu | Ala | Val | Ile | Leu | Ser | 35 | 40 | 45 |
| Thr | Cys | Asn | Arg | Thr | Glu | Leu | Tyr | Cys | Val | Gly | Asp | Ser | Glu | Glu | Ile | 50 | 55 | 60 |
| Ile | Arg | Trp | Leu | Ala | Asp | Tyr | His | Ser | Leu | Pro | Ile | Glu | Glu | Ile | Ser | 65 | 70 | 75 |
| Pro | Tyr | Leu | Tyr | Thr | Leu | Gly | Met | Gln | Glu | Thr | Val | Arg | His | Ala | Phe | 85 | 90 | 95 |
| Arg | Val | Ala | Cys | Gly | Leu | Asp | Ser | Met | Val | Leu | Gly | Glu | Pro | Gln | Ile | 100 | 105 | 110 |
| Leu | Gly | Gln | Ile | Lys | Asp | Ala | Val | Arg | Val | Ala | Gln | Glu | Gln | Glu | Ser | 115 | 120 | 125 |
| Met | Gly | Lys | Lys | Leu | Asn | Ala | Leu | Phe | Gln | Lys | Thr | Phe | Ser | Val | Ala | 130 | 135 | 140 |
| Lys | Glu | Val | Arg | Thr | Asp | Thr | Ala | Val | Gly | Glu | Asn | Ser | Val | Ser | Met | 145 | 150 | 155 |
| Ala | Ser | Ala | Ser | Val | Lys | Leu | Ala | Glu | Gln | Ile | Phe | Pro | Asp | Ile | Gly | 165 | 170 | 175 |
| Asp | Leu | Asn | Val | Leu | Phe | Ile | Gly | Ala | Gly | Glu | Met | Ile | Glu | Leu | Val | 180 | 185 | 190 |
| Ala | Thr | Tyr | Phe | Ala | Ala | Lys | Ser | Pro | Arg | Leu | Met | Thr | Val | Ala | Asn | 195 | 200 | 205 |
| Arg | Thr | Leu | Ala | Arg | Ala | Gln | Glu | Leu | Cys | Asp | Lys | Leu | Gly | Val | Asn | 210 | 215 | 220 |
| Ala | Glu | Pro | Cys | Leu | Leu | Ser | Asp | Leu | Pro | Ala | Ile | Leu | His | Glu | Tyr | 225 | 230 | 235 |
| Asp | Val | Val | Val | Ser | Ser | Thr | Ala | Ser | Gln | Leu | Pro | Ile | Val | Gly | Lys | 245 | 250 | 255 |
| Gly | Met | Val | Glu | Arg | Ala | Leu | Lys | Gln | Arg | Gln | Ser | Met | Pro | Leu | Phe | 260 | 265 | 270 |
| Met | Leu | Asp | Leu | Ala | Val | Pro | Arg | Asp | Ile | Glu | Ala | Glu | Val | Gly | Asp | 275 | 280 | 285 |
| Leu | Asn | Asp | Ala | Tyr | Leu | Tyr | Thr | Val | Asp | Asp | Met | Val | Asn | Ile | Val | 290 | 295 | 300 |
| Gln | Ser | Gly | Lys | Glu | Ala | Arg | Gln | Lys | Ala | Ala | Ala | Ala | Ala | Glu | Thr | 305 | 310 | 315 |
| Leu | Val | Ser | Glu | Lys | Val | Ala | Glu | Phe | Val | Arg | Gln | Gln | Gln | Gly | Arg | 325 | 330 | 335 |

Gln Ser Val Pro Leu Ile Arg Ala Leu Arg Asp Glu Gly Glu Lys Ala
340 345 350

Arg Lys Gln Val Leu Glu Asn Ala Met Lys Gln Leu Ala Lys Gly Ala
355 360 365

Thr Ala Glu Glu Val Leu Glu Arg Leu Ser Ile Gln Leu Thr Asn Lys
370 375 380

Leu Leu His Ser Pro Thr Gln Thr Leu Asn Lys Ala Gly Glu Glu Asp
385 390 395 400

Lys Asp Leu Val His Ala Val Ala Gln Ile Tyr His Leu Asp Lys
405 410 415

<210> 1997

<211> 360

<212> DNA

<213> Neisseria gonorrhoeae

<400> 1997

atgatccggtt atctttttaat tgcttgcggc ggcattctccc tgctgttggg gataatcggc 60
atcttttttgc cgctgttgcc gaccacgccg ttcgtactac tctccgccgc ctgctgggca 120
aaggcatccc cgcgctttca ccgctggctg caccggcacc gctatttcgg cccgatgggt 180
cataactggg aacaaaacgg cgcagtgccg cgcaaagcca agattttcgc catcagcatg 240
ataaccgcat cctgcctcat gatcttttgg cattttcccc aacnctgggtg ggtcggggcg 300
gtttcatcgg ttttttgttc ccttgtcacc atacggatgt ggcacagacc cgaatcttga 360

<210> 1998

<211> 119

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1998

Met Ile Arg Tyr Leu Leu Ile Ala Cys Gly Gly Ile Ser Leu Leu Leu
1 5 10 15

Gly Ile Ile Gly Ile Phe Leu Pro Leu Leu Pro Thr Thr Pro Phe Val
20 25 30

Leu Leu Ser Ala Ala Cys Trp Ala Lys Ala Ser Pro Arg Phe His Arg
35 40 45

Trp Leu His Arg His Arg Tyr Phe Gly Pro Met Val His Asn Trp Glu
50 55 60

Gln Asn Gly Ala Val Pro Arg Lys Ala Lys Ile Phe Ala Ile Ser Met
65 70 75 80

Ile Thr Ala Ser Cys Leu Met Ile Phe Trp His Phe Pro Gln Xaa Trp
85 90 95

Trp Val Gly Ala Val Ser Ser Val Phe Cys Ser Leu Val Thr Ile Arg

100

105

110

Met Trp His Arg Pro Glu Ser
115

<210> 1999

<211> 360

<212> DNA

<213> Neisseria meningitidis

<400> 1999

atgatacgtt atcttttaaat tgcctgcggc tgcatttccc tactgttggg tatcatcggc 60
atttttttgc cgctgttgcc gaccacgccg ttcgtactgc tctccgccgc ctgctgggca 120
aaggcatccc cgcgttttta ccgctggctg caccggcacc gctatttcgg ccgatgggtt 180
cataactggg aacaaaacgg cgcagtgccg cgcaaagcca aaatattcgc catcagtatg 240
atgaccgcat cctgcctgat aatgttttgg cagtttcccc aacgctgggtg ggtcggggcg 300
gtttcatcgg ttttttgttc cttgtcgc atattggatgt ggccgaggcc cgaatcttga 360

<210> 2000

<211> 119

<212> PRT

<213> Neisseria meningitidis

<400> 2000

Met Ile Arg Tyr Leu Leu Ile Ala Cys Gly Cys Ile Ser Leu Leu Leu
1 5 10 15

Gly Ile Ile Gly Ile Phe Leu Pro Leu Leu Pro Thr Thr Pro Phe Val
20 25 30

Leu Leu Ser Ala Ala Cys Trp Ala Lys Ala Ser Pro Arg Phe Tyr Arg
35 40 45

Trp Leu His Arg His Arg Tyr Phe Gly Pro Met Val His Asn Trp Glu
50 55 60

Gln Asn Gly Ala Val Pro Arg Lys Ala Lys Ile Phe Ala Ile Ser Met
65 70 75 80

Met Thr Ala Ser Cys Leu Ile Met Phe Trp Gln Phe Pro Gln Arg Trp
85 90 95

Trp Val Gly Ala Val Ser Ser Val Phe Cys Ser Leu Val Ala Ile Trp
100 105 110

Met Trp Arg Arg Pro Glu Ser
115

<210> 2001

<211> 360

<212> DNA

<213> Neisseria meningitidis

<400> 2001

atgatacggtt atcttttaaat tgcctgcggc tgcatttccc tgctgttggg tatcatcggc 60
 atttttttgc cgctgttgcc gaccacgccg ttcgtactgc tctccgccgc ctgctgggca 120
 aaggcatccc cgcgctttca ccgctggctg caccggcacc gctatttcgg tccgatgggt 180
 cataactggg aacaaaacgg cgcagtgccg cgcaaagcca aaatattcgc catcagtatg 240
 atgacgcgat cctgcctgat aatgttttgg cagtttcccc aaegctgggt ggtcggggcg 300
 gtttcatcgg ttttttggtc ccttgtcgcc atatggatgt ggcgcaggcc cgaatcttga 360

<210> 2002

<211> 119

<212> PRT

<213> Neisseria meningitidis

<400> 2002

Met Ile Arg Tyr Leu Leu Ile Ala Cys Gly Cys Ile Ser Leu Leu Leu
 1 5 10 15

Gly Ile Ile Gly Ile Phe Leu Pro Leu Leu Pro Thr Thr Pro Phe Val
 20 25 30

Leu Leu Ser Ala Ala Cys Trp Ala Lys Ala Ser Pro Arg Phe His Arg
 35 40 45

Trp Leu His Arg His Arg Tyr Phe Gly Pro Met Val His Asn Trp Glu
 50 55 60

Gln Asn Gly Ala Val Pro Arg Lys Ala Lys Ile Phe Ala Ile Ser Met
 65 70 75 80

Met Thr Ala Ser Cys Leu Ile Met Phe Trp Gln Phe Pro Gln Arg Trp
 85 90 95

Trp Val Gly Ala Val Ser Ser Val Phe Cys Ser Leu Val Ala Ile Trp
 100 105 110

Met Trp Arg Arg Pro Glu Ser
 115

<210> 2003

<211> 354

<212> DNA

<213> Neisseria meningitidis

<400> 2003

atgtttgcaa ccaggaaaat gaagaagatg acgatgtgca cgcggcggggt acggtttttg 60
 ttggctttca gcagcggacg aatcatcagc attgctgcgc cggtcgttcc catgatagag 120
 gcaagtgccg taccgacggc aagcagggcg gtgttgagct tgggtgtgcc gttcaagtcg 180
 ccccaaacca aaatgccgcc tgaaatgggt tacagggcaa gcagcagcag gatgaaaggg 240
 atgtattctt caacgagtgc gtgtgcgacg gtatggatac cggcggacgc gccaaaaacc 300
 aaactgaacg ggatgaggaa gagcaatgtc caaaaggcgg taattttgcc gtaa 354

<210> 2004

<211> 117

<212> PRT

<213> Neisseria gonorrhoeae

<400> 2004

Met Phe Ala Thr Arg Lys Met Lys Lys Met Thr Met Cys Thr Arg Arg
1 5 10 15

Val Arg Ser Trp Leu Ala Phe Ser Ser Gly Arg Ile Ile Ser Ile Ala
20 25 30

Ala Pro Val Val Pro Met Ile Glu Ala Ser Ala Val Pro Thr Ala Ser
35 40 45

Arg Ala Val Leu Ser Leu Gly Val Pro Phe Lys Ser Pro Gln Thr Lys
50 55 60

Met Pro Pro Glu Met Val Tyr Arg Ala Ser Ser Ser Arg Met Lys Gly
65 70 75 80

Ile Tyr Ser Ser Thr Ser Ala Cys Ala Thr Val Trp Ile Pro Ala Asp
85 90 95

Ala Pro Lys Thr Lys Leu Asn Gly Met Arg Lys Ser Asn Val Gln Lys
100 105 110

Ala Val Ile Leu Pro
115

<210> 2005

<211> 354

<212> DNA

<213> *Neisseria meningitidis*

<400> 2005

atgtttgcaa ccaggaaaat gaagaagatg acgatgtgca cgcggcggggt acggttttgg 60
ttggctttca gcagcggacg aatcatcagc attgctgcgc cggtcgttcc catgatagag 120
gcaagtgccg taccgacggc aagcagggcg gtgttgagct tgggtgtgcc gttcaagtcg 180
cccaaacc aaatgccgcc tgaaatggtg tacagggcaa gcagcagcag gatgaaaggg 240
atgtattctt caacgagtgc gtgtgcgacg gtatggatac cggcggacgc gccaaaaacc 300

aaactgaacg ggatgaggaa gagcaatgtc caaaaggcgg taattttgcc gtaa 354

<210> 2006

<211> 117

<212> PRT

<213> *Neisseria meningitidis*

<400> 2006

Met Phe Ala Thr Arg Lys Met Lys Lys Met Thr Met Cys Thr Arg Arg
1 5 10 15

Val Arg Phe Trp Leu Ala Phe Ser Ser Gly Arg Ile Ile Ser Ile Ala
20 25 30

Ala Pro Val Val Pro Met Ile Glu Ala Ser Ala Val Pro Thr Ala Ser
35 40 45

Arg Ala Val Leu Ser Leu Gly Val Pro Phe Lys Ser Pro Gln Thr Lys
50 55 60

Met Pro Pro Glu Met Val Tyr Arg Ala Ser Ser Ser Arg Met Lys Gly
65 70 75 80

Met Tyr Ser Ser Thr Ser Ala Cys Ala Thr Val Trp Ile Pro Ala Asp
85 90 95

Ala Pro Lys Thr Lys Leu Asn Gly Met Arg Lys Ser Asn Val Gln Lys
100 105 110

Ala Val Ile Leu Pro
115

<210> 2007
<211> 354
<212> DNA

<213> Neisseria gonorrhoeae

<400> 2007
atgtttgcaa ccaggaaaat gaagaagatg acgatgtgca cgcggcgggt acggtcttgg 60
ttggctttca gcagcggacg aatcatcagc attgccgcgc cggtcgttcc catgatagag 120
gcaagtgccg taccgacggc aagcagggcg gtgttgagct tgggtgtgcc gttcaagtcg 180
cccaaacca aaatgccgcc tgaaatggtg tacagggcaa gcagcagcag gatgaagggg 240
atatattctt caacgagtgc gtgtgcgacg gtatggatac cggcggacgc gccaaaaacc 300
aaactgaacg ggatgaggaa gagcaatgtc caaaaggcgg tgattttgcc gtaa 354

<210> 2008
<211> 117
<212> PRT
<213> Neisseria meningitidis

<400> 2008
Met Phe Ala Thr Arg Lys Met Lys Lys Met Thr Met Cys Thr Arg Arg
1 5 10 15

Val Arg Phe Trp Leu Ala Phe Ser Ser Gly Arg Ile Ile Ser Ile Ala
20 25 30

Ala Pro Val Val Pro Met Ile Glu Ala Ser Ala Val Pro Thr Ala Ser
35 40 45

Arg Ala Val Leu Ser Leu Gly Val Pro Phe Lys Ser Pro Gln Thr Lys
50 55 60

Met Pro Pro Glu Met Val Tyr Arg Ala Ser Ser Ser Arg Met Lys Gly
65 70 75 80

Met Tyr Ser Ser Thr Ser Ala Cys Ala Thr Val Trp Ile Pro Ala Asp
85 90 95

Ala Pro Lys Thr Lys Leu Asn Gly Met Arg Lys Ser Asn Val Gln Lys
100 105 110

Ala Val Ile Leu Pro
115

<210> 2009
<211> 633
<212> DNA
<213> Neisseria gonorrhoeae

<400> 2009
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ctgcaaaacc ttgtccgcga tgtcatcctg attacattga ccgccgtatc tatggcaatc 120
acgccc aaac aagtccgcgc aggcaacgaa ttcaactttg aaccatcgcc cgaagtgggc 180
aaactcttcc tcggcatctt catcaccatc ttccccgtcc tgagcattct gaaagcaggc 240
gaggcaggcg cgctgggcgg ggtggtatcg ctgggtcacg atacggcagg tcatccgatt 300
aatacgatgt atttctggat gagcggcata ttgtcggcat tcttgataa cgcgcccact 360
tatctcgtgt ttttcaatat ggcgggcggc gatgcccaag ccttaatgac gggccccctg 420
tttcattcgc tgctggcggt ttctatgggt tcggtattca tgggcgcact gacctacatc 480
ggcaacgcac cgaacttcat ggtcaaggcc attgccgaac agcgcggcgt accgatgccg 540
actttcttcc ggtatatgat gtggtcggtc gccttcctga caccgcgtct catcgtacat 600
accctcgtct ttttcgtttt caaactactg taa 633

<210> 2010
<211> 210
<212> PRT
<213> Neisseria gonorrhoeae

<400> 2010
Met Ser Gly Leu Trp Lys Pro Glu His Pro Gly Phe Glu Ile Leu Gly
1 5 10 15
Ser Arg Tyr Ala Leu Gln Asn Leu Val Arg Asp Val Ile Leu Ile Thr
20 25 30
Leu Thr Ala Val Ser Met Ala Ile Thr Pro Lys Gln Val Arg Ala Gly
35 40 45
Asn Glu Phe Asn Phe Glu Pro Ile Ala Glu Val Gly Lys Leu Phe Leu
50 55 60
Gly Ile Phe Ile Thr Ile Phe Pro Val Leu Ser Ile Leu Lys Ala Gly
65 70 75 80
Glu Ala Gly Ala Leu Gly Gly Val Val Ser Leu Val His Asp Thr Ala
85 90 95
Gly His Pro Ile Asn Thr Met Tyr Phe Trp Met Ser Gly Ile Leu Ser
100 105 110
Ala Phe Leu Asp Asn Ala Pro Thr Tyr Leu Val Phe Phe Asn Met Ala
115 120 125
Gly Gly Asp Ala Gln Ala Leu Met Thr Gly Pro Leu Phe His Ser Leu
130 135 140

Leu Ala Val Ser Met Gly Ser Val Phe Met Gly Ala Leu Thr Tyr Ile
 145 150 155 160

Gly Asn Ala Pro Asn Phe Met Val Lys Ala Ile Ala Glu Gln Arg Gly
 165 170 175

Val Pro Met Pro Thr Phe Phe Arg Tyr Met Met Trp Ser Val Ala Phe
 180 185 190

Leu Thr Pro Val Phe Ile Val His Thr Leu Val Phe Phe Val Phe Lys
 195 200 205

Leu Leu
 210

<210> 2011

<211> 633

<212> DNA

<213> Neisseria meningitidis

<400> 2011

atgtccggcc tttggaaacc cgaacacccg ggatttgaaa tcctcggcag ccgttacgcc 60
 ctgcaaaacc tcgtccgcga tgtcatcctg attgcattga ccgccgtatc tatggcaatc 120
 acgccc aaac aagtccgcgc aggcaacgaa ttcaactttg aaccatcgc cgaagtgggc 180
 aaactcttcc tcggcatctt catcaccatc tttcccgtcc tgagcattct gaaagcaggc 240
 gaggcaggcg cgctgggcgg ggtggtatcg ctggttcacg atacggcagg tcatccgatt 300
 aatgtgatgt atttttggat gagcggcata ttgtcggcat tcttggataa cgcgccact 360
 tatctcgttt ttttcaatat ggcgggcggc gatgcccaag ccttgatgac gggtaacctg 420
 tttcattcgc tgctggcggg ttctatgggt tcggtattca tgggcgcact gacctacac 480
 ggcaacgcac cgaacttcat ggtcaaggcc attgccgaac agcgcggcgt accgatgccg 540
 actttcttcg gctatatgat gtggtcgggc gccttcctga caccgtctt catcgatcat 600
 acccttatct ttttcgtttt caaactgctg taa 633

<210> 2012

<211> 210

<212> PRT

<213> Neisseria meningitidis

<400> 2012

Met Ser Gly Leu Trp Lys Pro Glu His Pro Gly Phe Glu Ile Leu Gly
 1 5 10 15

Ser Arg Tyr Ala Leu Gln Asn Leu Val Arg Asp Val Ile Leu Ile Ala
 20 25 30

Leu Thr Ala Val Ser Met Ala Ile Thr Pro Lys Gln Val Arg Ala Gly
 35 40 45

Asn Glu Phe Asn Phe Glu Pro Ile Ala Glu Val Gly Lys Leu Phe Leu
 50 55 60

Gly Ile Phe Ile Thr Ile Phe Pro Val Leu Ser Ile Leu Lys Ala Gly
 65 70 75 80

Glu Ala Gly Ala Leu Gly Gly Val Val Ser Leu Val His Asp Thr Ala

| | | | | | |
|---|-----|--|-----|--|-----|
| | 85 | | 90 | | 95 |
| Gly His Pro Ile Asn Val Met Tyr Phe Trp Met Ser Gly Ile Leu Ser | | | | | |
| | 100 | | 105 | | 110 |
| Ala Phe Leu Asp Asn Ala Pro Thr Tyr Leu Val Phe Phe Asn Met Ala | | | | | |
| | 115 | | 120 | | 125 |
| Gly Gly Asp Ala Gln Ala Leu Met Thr Gly Thr Leu Phe His Ser Leu | | | | | |
| | 130 | | 135 | | 140 |
| Leu Ala Val Ser Met Gly Ser Val Phe Met Gly Ala Leu Thr Tyr Ile | | | | | |
| | 145 | | 150 | | 155 |
| Gly Asn Ala Pro Asn Phe Met Val Lys Ala Ile Ala Glu Gln Arg Gly | | | | | |
| | 165 | | 170 | | 175 |
| Val Pro Met Pro Thr Phe Phe Gly Tyr Met Met Trp Ser Val Ala Phe | | | | | |
| | 180 | | 185 | | 190 |
| Leu Thr Pro Val Phe Ile Val His Thr Leu Ile Phe Phe Val Phe Lys | | | | | |
| | 195 | | 200 | | 205 |
| Leu Leu | | | | | |
| | 210 | | | | |

<210> 2013
 <211> 633
 <212> DNA
 <213> Neisseria meningitidis

<400> 2013
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 ctgcaaaacc tcgtccgcga tgtcatcctg attgcattga ccgccgtatc tatggcaatc 120
 acgccccaaac aagtccgcgc aggcaacgaa ttcaactttg aaccatcgc cgaagtgggc 180
 aaactcttcc tcggcatctt catcaccatc tttcccgctc tgagcattct gaaagcaggc 240
 gaggcaggcg cgctgggcgg ggtggtatcg ctggttcacg atacggcagg tcatccgatt 300
 aatgtgatgt atttttggat gagcggcata ttgtcggcat tcttggataa cgcgccact 360
 tatctcgttt ttttcaatat ggcggggcggc gatgccaaag ccttgatgac gggttccctg 420
 tttcattcgc tgctggcggg ttctatgggt tcggtattca tgggcgcact gacctacatc 480
 ggcaacgcac cgaacttcat ggtcaaggcc attgccgaac agcgcggcgt accgatgccg 540
 actttcttcg gctatatgat gtggtcggtc gccttcctga caccgtctt catcgtacat 600
 acccttatct ttttcgtttt caaactgctg taa 633

<210> 2014
 <211> 210
 <212> PRT
 <213> Neisseria meningitidis

<400> 2014
 Met Ser Gly Leu Trp Lys Pro Glu His Pro Gly Phe Glu Ile Leu Gly
 1 5 10 15
 Ser Arg Tyr Ala Leu Gln Asn Leu Val Arg Asp Val Ile Leu Ile Ala
 20 25 30

Leu Thr Ala Val Ser Met Ala Ile Thr Pro Lys Gln Val Arg Ala Gly
 35 40 45
 Asn Glu Phe Asn Phe Glu Pro Ile Ala Glu Val Gly Lys Leu Phe Leu
 50 55 60
 Gly Ile Phe Ile Thr Ile Phe Pro Val Leu Ser Ile Leu Lys Ala Gly
 65 70 75 80
 Glu Ala Gly Ala Leu Gly Gly Val Val Ser Leu Val His Asp Thr Ala
 85 90 95
 Gly His Pro Ile Asn Val Met Tyr Phe Trp Met Ser Gly Ile Leu Ser
 100 105 110
 Ala Phe Leu Asp Asn Ala Pro Thr Tyr Leu Val Phe Phe Asn Met Ala
 115 120 125
 Gly Gly Asp Ala Gln Ala Leu Met Thr Gly Ser Leu Phe His Ser Leu
 130 135 140
 Leu Ala Val Ser Met Gly Ser Val Phe Met Gly Ala Leu Thr Tyr Ile
 145 150 155 160
 Gly Asn Ala Pro Asn Phe Met Val Lys Ala Ile Ala Glu Gln Arg Gly
 165 170 175
 Val Pro Met Pro Thr Phe Phe Gly Tyr Met Met Trp Ser Val Ala Phe
 180 185 190
 Leu Thr Pro Val Phe Ile Val His Thr Leu Ile Phe Phe Val Phe Lys
 195 200 205
 Leu Leu
 210

<210> 2015
 <211> 363
 <212> DNA
 <213> *Neisseria gonorrhoeae*

<400> 2015
 atgtgcgtgc cactcaagcc ggcaggatgc gggccgcca attcatgtgt ttcgatattg 60
 gcagcatttt cagacggcac gtctgcgcct gctgctttac acacatggat tttacgttcg 120
 gtcaggcggc tcaataccaa caggccgcgt ttgaagtctt cggcggcttc tttgatgatg 180
 accgtagggt cggcagccag cggattggtg tccatcgcat tgacgaagat ggcgaacggc 240
 tcggcatcta cggcagggat tttgctgaac ggacgggtgc gaagcgcagt ccataagcct 300
 gattgaatca ggttgcggcg cactttttcg ctgctcaatt ttgccagcgc ttcaggtacg 360
 tag 363

<210> 2016
 <211> 119
 <212> PRT
 <213> *Neisseria gonorrhoeae*

<400> 2016

Met Cys Val Pro Leu Lys Pro Ala Gly Cys Gly Pro Pro Asn Ser Cys
1 5 10 15

Val Ser Ile Leu Ala Ala Phe Ser Asp Gly Thr Ser Ala Pro Ala Ala
20 25 30

Leu His Thr Trp Ile Leu Arg Ser Val Arg Arg Leu Asn Thr Asn Arg
35 40 45

Pro Arg Leu Lys Ser Ser Ala Ala Ser Leu Met Met Thr Val Gly Ser
50 55 60

Ala Ala Ser Gly Leu Val Ser Ile Ala Leu Thr Lys Met Ala Asn Gly
65 70 75 80

Ser Ala Ser Thr Ala Gly Ile Leu Leu Asn Gly Arg Val Arg Ser Ala
85 90 95

Val His Lys Pro Asp Ile Arg Leu Arg Arg Thr Phe Ser Leu Leu Asn
100 105 110

Phe Ala Ser Ala Ser Gly Thr
115

<210> 2017

<211> 363

<212> DNA

<213> Neisseria meningitidis

<400> 2017

atgtcgtgc cactcaaacc ggcaggatgc gggccgcoga attcatgtgt ttcgatgttg 60
gcagcatttt cagacggcac gtctgcgcca gctgccttac aaacatggat tttgcgttcg 120
gtcaaaccggc tcaataccaa caggccgcgt ttgaaatcct cggcggcttc tttgataatg 180
accgtagggt cggcagccag cggattggtg tccatcgcat tgacgaagat ggcgaacggc 240
tcggcatcga cggcaggaat tttgctgaac ggacgggtgc gcagcgcagt ccacaaaccg 300
gattggatca ggttgcggcg cacttcttcg ccgcttaagt ttgccagcgc ttcaggtgcg 360
tag 363

<210> 2018

<211> 120

<212> PRT

<213> Neisseria meningitidis

<400> 2018

Met Cys Val Pro Leu Lys Pro Ala Gly Cys Gly Pro Pro Asn Ser Cys
1 5 10 15

Val Ser Met Leu Ala Ala Phe Ser Asp Gly Thr Ser Ala Pro Ala Ala
20 25 30

Leu Gln Thr Trp Ile Leu Arg Ser Val Lys Arg Leu Asn Thr Asn Arg
35 40 45

Pro Arg Leu Lys Ser Ser Ala Ala Ser Leu Ile Met Thr Val Gly Ser
 50 55 60

Ala Ala Ser Gly Leu Val Ser Ile Ala Leu Thr Lys Met Ala Asn Gly
 65 70 75 80

Ser Ala Ser Thr Ala Gly Ile Leu Leu Asn Gly Arg Val Arg Ser Ala
 85 90 95

Val His Lys Pro Asp Trp Ile Arg Leu Arg Arg Thr Ser Ser Pro Leu
 100 105 110

Lys Phe Ala Ser Ala Ser Gly Ala
 115 120

<210> 2019

<211> 363

<212> DNA

<213> Neisseria meningitidis

<400> 2019

atgtgctgtgc cactcaaacc ggccggatgc gggccgccga attcatgtgt ttcgatgttg 60
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 gtcaaacggc tcaataccag caaacctcgt ctgaaatcct cggcggttc tttgatcaca 180
 accacagggc ctgccgccag cggattgggtg tccatcgcat tgacgaagat ggcgaacggc 240
 tcggcatcga cggcagggat tttgctgaac ggacgggtac gcagcgcagt ccacaaaccg 300
 gattgatca gattgcggcg cacttcttcg ccgcttaagt ttgccaacgc ttcgggcgcg 360
 tag 363

<210> 2020

<211> 120

<212> PRT

<213> Neisseria meningitidis

<400> 2020

Met Cys Val Pro Leu Lys Pro Ala Gly Cys Gly Pro Pro Asn Ser Cys
 1 5 10 15

Val Ser Met Leu Ala Ala Phe Ser Asp Gly Thr Ser Ala Pro Ala Ala
 20 25 30

Leu His Thr Trp Ile Leu Arg Ser Val Lys Arg Leu Asn Thr Ser Lys
 35 40 45

Pro Arg Leu Lys Ser Ser Ala Ala Ser Leu Ile Thr Thr Thr Gly Ser
 50 55 60

Ala Ala Ser Gly Leu Val Ser Ile Ala Leu Thr Lys Met Ala Asn Gly
 65 70 75 80

Ser Ala Ser Thr Ala Gly Ile Leu Leu Asn Gly Arg Val Arg Ser Ala
 85 90 95

Val His Lys Pro Asp Trp Ile Arg Leu Arg Arg Thr Ser Ser Pro Leu

100

105

110

Lys Phe Ala Asn Ala Ser Gly Ala
115 120

<210> 2021

<211> 968

<212> DNA

<213> Neisseria gonorrhoeae

<400> 2021

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gccgtcagcc tgcgggtcgg cattgccgat ttccgctggt cggatgtgtt ttcgctgtcc 120
gacagccagc aagtgatgtt catcagccgc ctgccgcgca cgtttgcgat tgtgttgacg 180
ggcgcgctga tagcgggtggc ggggatgatt atgcagattc tgatgcgcaa ccgttttgtc 240
gagccttcta tggcgggtgc gggccaaagt gcggttttg gtttgcttct gatgtccctg 300
ctgctgcctg ccgcgccgct gccggtcaaa atgtcggtag ccgcggttg ccgctgatc 360
gggatgttgg tctttatgct gctaataccg cgctgccac cgacggcgca gctgatggtg 420
ccgctggtgg ggttattttc ggcggtgtgg ttgaggcggg ggcgacgttt gtcgcgtatg 480
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tggggcggtg cgagctgctt tggattacgg gcggtttggc ggtgtttgcc tacctgattg 600
ccgaccggct gacgattttg gggctgggcg agacggtgag cgtgaatttg ggtttgaacc 660
ggacggcggt gttgtggtcg ggtttgatta ttgtggcact gattacatcg ctggtcattg 720
taacggtcgg caatattccg tttatcgggc tggtcgtgcc gaatatcgtc agccgcctga 780
tgggcgacag gctgcgcaa agcctgcctg cggtcgccct cttgggcgcg tctttggttt 840
tattgtgcga cattatcgga cgcattgatt tgtttccgtt tgaaattccg gtctccacgg 900
tttttggtgt gttgggtacg gctttgtttt tgtggctttt gttgaggaaa cccgcctatg 960
ccgtctga 968

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<210> 2022

<211> 322

<212> PRT

<213> Neisseria gonorrhoeae

<400> 2022

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Met Thr Ala Lys Pro Phe Ser Leu Asn Leu Ala Asn Leu Leu Leu Pro
 1           5           10          15

Ala Val Leu Phe Ala Val Ser Leu Ser Val Gly Ile Ala Asp Phe Arg
      20           25           30

Trp Ser Asp Val Phe Ser Leu Ser Asp Ser Gln Gln Val Met Phe Ile
 35           40           45

Ser Arg Leu Pro Arg Thr Phe Ala Ile Val Leu Thr Gly Ala Ser Ile
 50           55           60

Ala Val Ala Gly Met Ile Met Gln Ile Leu Met Arg Asn Arg Phe Val
 65           70           75           80

Glu Pro Ser Met Ala Gly Ala Gly Gln Ser Ala Ala Leu Gly Leu Leu
      85           90           95

Leu Met Ser Leu Leu Leu Pro Ala Ala Pro Leu Pro Val Lys Met Ser
100           105          110

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Val Ala Ala Val Ala Ala Leu Ile Gly Met Leu Val Phe Met Leu Leu
 115 120 125
 Ile Arg Arg Leu Pro Pro Thr Ala Gln Leu Met Val Pro Leu Val Gly
 130 135 140
 Xaa Ile Phe Gly Gly Val Val Glu Ala Val Ala Thr Phe Val Ala Tyr
 145 150 155 160
 Glu Phe Glu Met Leu Gln Met Leu Gly Val Trp Gln Gln Gly Asp Phe
 165 170 175
 Ser Ser Val Leu Leu Gly Arg Tyr Glu Leu Leu Trp Ile Thr Gly Gly
 180 185 190
 Leu Ala Val Phe Ala Tyr Leu Ile Ala Asp Arg Leu Thr Ile Leu Gly
 195 200 205
 Leu Gly Glu Thr Val Ser Val Asn Leu Gly Leu Asn Arg Thr Ala Val
 210 215 220
 Leu Trp Ser Gly Leu Ile Ile Val Ala Leu Ile Thr Ser Leu Val Ile
 225 230 235 240
 Val Thr Val Gly Asn Ile Pro Phe Ile Gly Leu Val Val Pro Asn Ile
 245 250 255
 Val Ser Arg Leu Met Gly Asp Arg Leu Arg Gln Ser Leu Pro Ala Val
 260 265 270
 Ala Leu Leu Gly Ala Ser Leu Val Leu Leu Cys Asp Ile Ile Gly Arg
 275 280 285
 Met Ile Val Phe Pro Phe Glu Ile Pro Val Ser Thr Val Phe Gly Val
 290 295 300
 Leu Gly Thr Ala Leu Phe Leu Trp Leu Leu Leu Arg Lys Pro Ala Tyr
 305 310 315 320
 Ala Val

<210> 2023

<211> 969

<212> DNA

<213> *Neisseria meningitidis*

<400> 2023

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 gacagccagc aggtcatgtt catcagccgc ctgccgcgca cgtttgcgat tgtgctgacg 180
 ggcgcgtcga tggcgggtggc cggcatgatt atgcagattt tgatgcgcaa ccgttttgtc 240
 gaaccgtcga tgggtgggccc aagccaaagc gcggctttag gtttgctgct gatgaccctg 300
 ctgctgccgg ccgcgcgcgt gccggcgaaa atgtcggttg ccgccgttgc cgcgctgata 360
 gggatgttgg tctttatgct gctgatccgc cgctgcccgc cgaccgcgca actgatggtg 420

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cctttggtcg ggattatattt cggcgggtgtg attgaggcgg tagccacctt tatcgcgat 480
gaaaacgaaa tgctgcaaat gctcggcgtg tggcagcagg gcgatttttc gagcgtgctg 540
ctggggcggt acgagctgct ttggattacg ggcggttttg cgggtgtttgc ctatctgatt 600
gccgaccggc tgacgatttt ggggctgggc gaaacggtaa gcgtgaattt gggtttgaac 660
cggacggcgg tggtgtggtc gggtttgatt attgtggcct tgattacgct gctggttatc 720
gttacggctg gcaatattcc gtttatcggg ctggtcgtgc cgaacatcat cagccgcctg 780
atgggcgaca ggttgcgcca aagcctgcct gcggtggcct tgctgggagc atctttggtg 840
ttgctgtgcg acattatcgg acgctgatt gtgtttcgt ttgaaattcc ggtctctacg 900
gtttttggtg tattgggtac ggctttgttt ttgtggcctt tgttgaggaa acccgctat 960
gccgtctga 969

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<210> 2024

<211> 322

<212> PRT

<213> *Neisseria meningitidis*

<400> 2024

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Met Thr Ala Lys Pro Phe Ser Leu Asn Leu Thr Asn Leu Leu Leu Leu
  1              5              10              15

Ala Val Leu Phe Ala Val Ser Leu Ser Val Gly Val Ala Asp Phe Arg
      20              25              30

Trp Ser Asp Val Phe Ser Leu Ser Asp Ser Gln Gln Val Met Phe Ile
      35              40              45

Ser Arg Leu Pro Arg Thr Phe Ala Ile Val Leu Thr Gly Ala Ser Met
      50              55              60

Ala Val Ala Gly Met Ile Met Gln Ile Leu Met Arg Asn Arg Phe Val
      65              70              75              80

Glu Pro Ser Met Val Gly Ala Ser Gln Ser Ala Ala Leu Gly Leu Leu
      85              90              95

Leu Met Thr Leu Leu Leu Pro Ala Ala Pro Leu Pro Ala Lys Met Ser
      100             105             110

Val Ala Ala Val Ala Ala Leu Ile Gly Met Leu Val Phe Met Leu Leu
      115             120             125

Ile Arg Arg Leu Pro Pro Thr Ala Gln Leu Met Val Pro Leu Val Gly
      130             135             140

Ile Ile Phe Gly Gly Val Ile Glu Ala Val Ala Thr Phe Ile Ala Tyr
      145             150             155             160

Glu Asn Glu Met Leu Gln Met Leu Gly Val Trp Gln Gln Gly Asp Phe
      165             170             175

Ser Ser Val Leu Leu Gly Arg Tyr Glu Leu Leu Trp Ile Thr Gly Gly
      180             185             190

Leu Ala Val Phe Ala Tyr Leu Ile Ala Asp Arg Leu Thr Ile Leu Gly
      195             200             205

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Leu Gly Glu Thr Val Ser Val Asn Leu Gly Leu Asn Arg Thr Ala Val
 210 215 220
 Leu Trp Ser Gly Leu Ile Ile Val Ala Leu Ile Thr Ser Leu Val Ile
 225 230 235 240
 Val Thr Val Gly Asn Ile Pro Phe Ile Gly Leu Val Val Pro Asn Ile
 245 250 255
 Ile Ser Arg Leu Met Gly Asp Arg Leu Arg Gln Ser Leu Pro Ala Val
 260 265 270
 Ala Leu Leu Gly Ala Ser Leu Val Leu Leu Cys Asp Ile Ile Gly Arg
 275 280 285
 Val Ile Val Phe Pro Phe Glu Ile Pro Val Ser Thr Val Phe Gly Val
 290 295 300
 Leu Gly Thr Ala Leu Phe Leu Trp Leu Leu Leu Arg Lys Pro Ala Tyr
 305 310 315 320
 Ala Val

<210> 2025
 <211> 969
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 2025
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 gacagccagc aggttatgtt catcagccgc ctgccgcgca cgtttgcgat tgtgttgacg 180
 ggcgcgtcga tggcgggtggc ggggatgatt atgcagattc tgatgcgtaa ccgttttgtc 240
 gagccttcta tggcggggcg gggtcagagt gcggcctttg gtttgcttct gatgtccctg 300
 ctgctgcctg ccgcgcgcgt gccgggtcaaa atgtcgggtg ccgcggttgc cgcgttaatc 360
 gggatgttg tgtttatgat gcttatccgc cgctgccgc cgacggcgca actgatggtg 420
 cctttggctg ggattatatt cggcggcgtg gttgaggcgg tggccacctt tattgcgtat 480
 gaaaacgaaa tgctgcaaat gctgggcgtg tggcaacagg gcgatttttc cggcgtgttg 540
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 gccgaccagc tgacgatttt gggtttgggc gaaacggtaa gcgtgaactt ggggctgaac 660
 cggacggcga ttctgtggtc ggggctgatt attgtggctt tgattacgtc gctggttatc 720
 gttacggctg gcaatattcc gtttatcggg ctggtcgtgc cgaacatcat cagccgcctg 780
 ataggcgaca ggctgcgcca aagcctgcct gcggtggctt tgctgggtgc gtccttggtt 840
 ttattgtgcg acattatcgg acgagtatt gtgtttccgt ttgaaattcc ggtatcgacc 900
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<210> 2026
 <211> 322
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 2026
 Met Thr Ala Lys Pro Phe Ser Leu Asn Leu Thr Asn Leu Leu Leu Leu

| 1 | 5 | 10 | 15 |
|---|---------------------|-----------------------------|-----|
| Ala Val Leu Phe | Ala Val Ser Leu Ser | Val Gly Val Ala Asp Phe Arg | |
| 20 | 25 | 30 | |
| Trp Ser Asp Val Phe Ser Leu Ser Asp Ser Gln Gln Val Met Phe Ile | | | |
| 35 | 40 | 45 | |
| Ser Arg Leu Pro Arg Thr Phe Ala Ile Val Leu Thr Gly Ala Ser Met | | | |
| 50 | 55 | 60 | |
| Ala Val Ala Gly Met Ile Met Gln Ile Leu Met Arg Asn Arg Phe Val | | | |
| 65 | 70 | 75 | 80 |
| Glu Pro Ser Met Ala Gly Ala Gly Gln Ser Ala Ala Leu Gly Leu Leu | | | |
| 85 | 90 | 95 | |
| Leu Met Ser Leu Leu Leu Pro Ala Ala Pro Leu Pro Val Lys Met Ser | | | |
| 100 | 105 | 110 | |
| Val Ala Ala Val Ala Ala Leu Ile Gly Met Leu Val Phe Met Met Leu | | | |
| 115 | 120 | 125 | |
| Ile Arg Arg Leu Pro Pro Thr Ala Gln Leu Met Val Pro Leu Val Gly | | | |
| 130 | 135 | 140 | |
| Ile Ile Phe Gly Gly Val Val Glu Ala Val Ala Thr Phe Ile Ala Tyr | | | |
| 145 | 150 | 155 | 160 |
| Glu Asn Glu Met Leu Gln Met Leu Gly Val Trp Gln Gln Gly Asp Phe | | | |
| 165 | 170 | 175 | |
| Ser Gly Val Leu Leu Gly Arg Tyr Glu Leu Leu Trp Ala Thr Gly Ile | | | |
| 180 | 185 | 190 | |
| Leu Ala Leu Phe Ala Tyr Leu Ile Ala Asp Gln Leu Thr Ile Leu Gly | | | |
| 195 | 200 | 205 | |
| Leu Gly Glu Thr Val Ser Val Asn Leu Gly Leu Asn Arg Thr Ala Ile | | | |
| 210 | 215 | 220 | |
| Leu Trp Ser Gly Leu Ile Ile Val Ala Leu Ile Thr Ser Leu Val Ile | | | |
| 225 | 230 | 235 | 240 |
| Val Thr Val Gly Asn Ile Pro Phe Ile Gly Leu Val Val Pro Asn Ile | | | |
| 245 | 250 | 255 | |
| Ile Ser Arg Leu Ile Gly Asp Arg Leu Arg Gln Ser Leu Pro Ala Val | | | |
| 260 | 265 | 270 | |
| Ala Leu Leu Gly Ala Ser Leu Val Leu Leu Cys Asp Ile Ile Gly Arg | | | |
| 275 | 280 | 285 | |
| Val Ile Val Phe Pro Phe Glu Ile Pro Val Ser Thr Val Phe Gly Val | | | |
| 290 | 295 | 300 | |
| Leu Gly Thr Ala Leu Phe Leu Trp Leu Leu Leu Arg Lys Pro Ala His | | | |

305

310

315

320

Ala Val

<210> 2027

<211> 852

<212> DNA

<213> Neisseria gonorrhoeae

<400> 2027

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ggcaattacg ccctcgccaa cgctttgggc atcaatatgt ccccggaagc gggcgtgttg 180
ggcaaaatgc tgctcggcgc gatttacttc ctgccgattt acgcgaccgt atttattgtg 240
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ttcgttactt cgattctgtt tgccttaatc gttccgcccc cgctgccgct gtggcaggcg 360
gctttgggta tttctttcgg cgttgtggtt gcgaaagaag tattcggcgg tacaggtaaa 420
aacttcataa accctgcgct ggcaggccgc gccttctgt tcttcgccta cccgccaac 480
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tggatggacg cgtttatcgg caaactgccc ggctccatcg gcgaagtctc cactttggca 660
ctcttaatcg gcggcgcggt tatcgtgttt gccgcacatg cttcttggcg cattattgcc 720
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<210> 2028

<211> 284

<212> PRT

<213> Neisseria gonorrhoeae

<400> 2028

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Met Met Ile Leu Val Trp Leu Ala Leu Phe Pro Pro Met Phe Tyr Gly
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Met Tyr Asn Val Gly Ala Gln Ala Phe Gly Ala Leu Thr Pro Asp Leu
      20                      25                      30

Leu Gln Gln Ser Ile Ala His Asp Gly Asn Tyr Ala Leu Ala Asn Ala
      35                      40                      45

Leu Gly Ile Asn Met Ser Pro Glu Ala Gly Val Leu Gly Lys Met Leu
      50                      55                      60

Phe Gly Ala Ile Tyr Phe Leu Pro Ile Tyr Ala Thr Val Phe Ile Val
      65                      70                      75                      80

Gly Gly Phe Trp Glu Val Leu Phe Ala Ser Val Arg Lys His Glu Ile
      85                      90                      95

Asn Glu Gly Phe Phe Val Thr Ser Ile Leu Phe Ala Leu Ile Val Pro
      100                      105                      110

Pro Thr Leu Pro Leu Trp Gln Ala Ala Leu Gly Ile Ser Phe Gly Val

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115 120 125
 Val Val Ala Lys Glu Val Phe Gly Gly Thr Gly Lys Asn Phe Met Asn
 130 135 140
 Pro Ala Leu Ala Gly Arg Ala Phe Leu Phe Phe Ala Tyr Pro Ala Asn
 145 150 155 160
 Leu Ser Gly Asp Ala Val Trp Thr Ala Val Asp Gly Tyr Ser Gly Ala
 165 170 175
 Thr Ala Leu Ala Gln Trp Ala Ala His Gly Ala Asp Gly Leu Lys Asn
 180 185 190
 Ala Val Thr Gly Gln Thr Ile Thr Trp Met Asp Ala Phe Ile Gly Lys
 195 200 205
 Leu Pro Gly Ser Ile Gly Glu Val Ser Thr Leu Ala Leu Leu Ile Gly
 210 215 220
 Gly Ala Phe Ile Val Phe Ala Arg Ile Ala Ser Trp Arg Ile Ile Ala
 225 230 235 240
 Gly Val Met Ile Gly Met Ile Ala Met Ser Ser Leu Ile Asn Phe Ile
 245 250 255
 Gly Ser Asp Thr Lys Ala Met Phe Ala Met His Leu Val His Gly Thr
 260 265 270
 Trp Trp Lys Asp Asp Tyr His Ser Leu Tyr Ile Lys
 275 280

<210> 2029
 <211> 1068
 <212> DNA
 <213> Neisseria meningitidis

<400> 2029
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 tggcattacg cctttgccaa cgctttgggc atcaatatgt cgtctgaagc gggcgtgtcg 180
 gacaaaatgc tgtttggcgc gatttacttc ctgccgattt acgcgactgt atttgttgtg 240
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 ttcgttactt cgattctggt tgccttaatc gttccgcca cgctgccgct gtggcaggcg 360
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 aacttcatga accctgcgct ggcaggccgt gctttcctgt tcttcgccta ccctgccaac 480
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 caatgggcgg cacacggtgc agacggcctg aaaaacgccg taaccggtca aaccatcact 600
 tggatggacg cgtttatcgg caaactgccc ggctccattg gcgaagtctc cactttggca 660
 ctcttaatcg gcggcgcggt tatcgtgttt gcccgcatcg cttcttggcg cattattgcc 720
 ggcgtgatga tcggtatgat tgcgatgtct tcgctgttca acttcatcgg ttcggacacc 780
 aacgctatgt ttgctatgcc ttggtactgg cacttggtgg tcggcggcct cgccatcgg 840
 atgctgttta tggcgaccga ccctgtttcc gcttccttta ccaatgtcgg caaatggtgg 900
 tacggcgcac tgatcggtgt gatgtgcgta ttaatccgcg tgggtcaatcc ggcttacc 960
 gaaggcatga tgttgcgat tctgtttgcc aacctgtttg ccccgatttt cgactatttc 1020
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<210> 2030
<211> 355
<212> PRT
<213> Neisseria meningitidis

<400> 2030

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Met | Met | Ile | Leu | Val | Trp | Leu | Ala | Leu | Phe | Pro | Ala | Met | Phe | Tyr | Gly | |
| 1 | | | | 5 | | | | | 10 | | | | | | 15 | |
| Met | Tyr | Asn | Val | Gly | Ala | Gln | Ala | Phe | Gly | Ala | Leu | Thr | Pro | Asp | Leu | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| Leu | Gln | Gln | Asn | Ile | Ala | Asn | Asp | Trp | His | Tyr | Ala | Phe | Ala | Asn | Ala | |
| | | | 35 | | | | 40 | | | | | 45 | | | | |
| Leu | Gly | Ile | Asn | Met | Ser | Ser | Glu | Ala | Gly | Val | Ser | Asp | Lys | Met | Leu | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |
| Phe | Gly | Ala | Ile | Tyr | Phe | Leu | Pro | Ile | Tyr | Ala | Thr | Val | Phe | Val | Val | |
| 65 | | | | | 70 | | | | 75 | | | | | | 80 | |
| Gly | Gly | Phe | Trp | Glu | Val | Leu | Phe | Ala | Thr | Val | Arg | Lys | His | Glu | Ile | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |
| Asn | Glu | Gly | Phe | Phe | Val | Thr | Ser | Ile | Leu | Phe | Ala | Leu | Ile | Val | Pro | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| Pro | Thr | Leu | Pro | Leu | Trp | Gln | Ala | Ala | Leu | Gly | Ile | Ser | Phe | Gly | Val | |
| | | 115 | | | | 120 | | | | | | 125 | | | | |
| Val | Val | Ala | Lys | Glu | Val | Phe | Gly | Gly | Thr | Gly | Lys | Asn | Phe | Met | Asn | |
| | | 130 | | | | 135 | | | | | 140 | | | | | |
| Pro | Ala | Leu | Ala | Gly | Arg | Ala | Phe | Leu | Phe | Phe | Ala | Tyr | Pro | Ala | Asn | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | |
| Leu | Ser | Gly | Asp | Ala | Val | Trp | Thr | Ala | Val | Asp | Gly | Tyr | Ser | Gly | Ala | |
| | | | | 165 | | | | | 170 | | | | | 175 | | |
| Thr | Ala | Leu | Ala | Gln | Trp | Ala | Ala | His | Gly | Ala | Asp | Gly | Leu | Lys | Asn | |
| | | | 180 | | | | | 185 | | | | | 190 | | | |
| Ala | Val | Thr | Gly | Gln | Thr | Ile | Thr | Trp | Met | Asp | Ala | Phe | Ile | Gly | Lys | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| Leu | Pro | Gly | Ser | Ile | Gly | Glu | Val | Ser | Thr | Leu | Ala | Leu | Leu | Ile | Gly | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| Gly | Ala | Phe | Ile | Val | Phe | Ala | Arg | Ile | Ala | Ser | Trp | Arg | Ile | Ile | Ala | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | |
| Gly | Val | Met | Ile | Gly | Met | Ile | Ala | Met | Ser | Ser | Leu | Phe | Asn | Phe | Ile | |
| | | | | 245 | | | | | 250 | | | | | 255 | | |
| Gly | Ser | Asp | Thr | Asn | Ala | Met | Phe | Ala | Met | Pro | Trp | Tyr | Trp | His | Leu | |

| | | |
|---|-----|-----|
| 260 | 265 | 270 |
| Val Val Gly Gly Phe Ala Ile Gly Met Leu Phe Met Ala Thr Asp Pro | | |
| 275 | 280 | 285 |
| Val Ser Ala Ser Phe Thr Asn Val Gly Lys Trp Trp Tyr Gly Ala Leu | | |
| 290 | 295 | 300 |
| Ile Gly Val Met Cys Val Leu Ile Arg Val Val Asn Pro Ala Tyr Pro | | |
| 305 | 310 | 315 |
| Glu Gly Met Met Leu Ala Ile Leu Phe Ala Asn Leu Phe Ala Pro Ile | | |
| | 325 | 330 |
| Phe Asp Tyr Phe Val Ala Gln Ala Asn Ile Lys Arg Arg Lys Ala Arg | | |
| | 340 | 345 |
| | | 350 |
| Ser Asn Gly | | |
| 355 | | |

<210> 2031
 <211> 1068
 <212> DNA
 <213> Neisseria meningitidis

<400> 2031

| | | | | | | |
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| ggcgcacagg | cattcgggtgc | gttaacgccc | gatttgcgtgc | aacaaagcat | cgccaacgac | 120 |
| tggcattacg | cccttgccaa | cgctttgggc | atcaatatgt | cgtctgaagc | gggcgtgttg | 180 |
| ggcaaaatgc | tgttcggcgc | gatttacttc | ctgccgattt | acgcgaccgt | atttattgtc | 240 |
| ggcgttttct | gggaagtttt | gttcgccacc | gtgcgcaaac | atgaaatcaa | cgaagggttc | 300 |
| tttgttacct | cgattctgtt | tgccttaatc | gttcgcgcca | cgctgcgct | gtggcaggca | 360 |
| gctttgggta | tttctttcgg | cgttgtgtgt | gcgaaagaag | tattcggcgg | tacaggtaaa | 420 |
| aacttcattga | accctgcgct | ggcaggccgt | gccttcctgt | tcttcgccta | ccctgccaac | 480 |
| ttgagcggcg | atgcggtttg | gacggcggtt | gacggctatt | ccggcgcaac | cgcgctggcg | 540 |
| caatgggcgg | cacacggtgc | agacggcctg | aaaaacgcca | taaccggtca | aaccatcact | 600 |
| tggatggatg | cgtttatcgg | caaactgccc | ggctccatcg | gcgaagtctc | cactttggca | 660 |
| ctcttaatcg | gcggcgcggt | tatcgtgttt | gcccgcatcg | cttcttggcg | cattattgcc | 720 |
| ggcgtgatga | tcggtatgat | tgccatgtct | tgcgtgttca | acttcacggt | ttcggacacc | 780 |
| aacgctatgt | ttgctatgcc | ttggtactgg | catttggtcg | tcggcggtt | cgccatcggt | 840 |
| atgctgttta | tggcgaccga | ccccgtttcc | gcttccttta | ccaatgtcgg | caaattggtg | 900 |
| tacggcgcac | tgatcgggtg | gatgtgcgta | ttaatccgcg | tggtcaatcc | ggcttaccct | 960 |
| gaaggcatga | tggtggcgat | tctgtttgcc | aaactgtttg | ccccgatttt | cgactatttc | 1020 |
| gtcgcacaag | cgaacatcaa | acgcagaaa | gcgcgcagca | atggctaa | | 1068 |

<210> 2032
 <211> 355
 <212> PRT
 <213> Neisseria meningitidis

<400> 2032

| |
|---|
| Met Met Ile Leu Val Trp Leu Ala Leu Phe Pro Ala Met Phe Tyr Gly |
| 1 5 10 15 |
| Met Tyr Asn Val Gly Ala Gln Ala Phe Gly Ala Leu Thr Pro Asp Leu |

| 20 | | | | | 25 | | | | | 30 | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Gln | Gln | Ser | Ile | Ala | Asn | Asp | Trp | His | Tyr | Ala | Leu | Ala | Asn | Ala |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Leu | Gly | Ile | Asn | Met | Ser | Ser | Glu | Ala | Gly | Val | Leu | Gly | Lys | Met | Leu |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Phe | Gly | Ala | Ile | Tyr | Phe | Leu | Pro | Ile | Tyr | Ala | Thr | Val | Phe | Ile | Val |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Gly | Phe | Trp | Glu | Val | Leu | Phe | Ala | Thr | Val | Arg | Lys | His | Glu | Ile |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Asn | Glu | Gly | Phe | Phe | Val | Thr | Ser | Ile | Leu | Phe | Ala | Leu | Ile | Val | Pro |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Pro | Thr | Leu | Pro | Leu | Trp | Gln | Ala | Ala | Leu | Gly | Ile | Ser | Phe | Gly | Val |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Val | Ala | Lys | Glu | Val | Phe | Gly | Gly | Thr | Gly | Lys | Asn | Phe | Met | Asn |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Pro | Ala | Leu | Ala | Gly | Arg | Ala | Phe | Leu | Phe | Phe | Ala | Tyr | Pro | Ala | Asn |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Leu | Ser | Gly | Asp | Ala | Val | Trp | Thr | Ala | Val | Asp | Gly | Tyr | Ser | Gly | Ala |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Thr | Ala | Leu | Ala | Gln | Trp | Ala | Ala | His | Gly | Ala | Asp | Gly | Leu | Lys | Asn |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Ala | Ile | Thr | Gly | Gln | Thr | Ile | Thr | Trp | Met | Asp | Ala | Phe | Ile | Gly | Lys |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Leu | Pro | Gly | Ser | Ile | Gly | Glu | Val | Ser | Thr | Leu | Ala | Leu | Leu | Ile | Gly |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Gly | Ala | Phe | Ile | Val | Phe | Ala | Arg | Ile | Ala | Ser | Trp | Arg | Ile | Ile | Ala |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Gly | Val | Met | Ile | Gly | Met | Ile | Ala | Met | Ser | Ser | Leu | Phe | Asn | Phe | Ile |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Gly | Ser | Asp | Thr | Asn | Ala | Met | Phe | Ala | Met | Pro | Trp | Tyr | Trp | His | Leu |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Val | Val | Gly | Gly | Phe | Ala | Ile | Gly | Met | Leu | Phe | Met | Ala | Thr | Asp | Pro |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Val | Ser | Ala | Ser | Phe | Thr | Asn | Val | Gly | Lys | Trp | Trp | Tyr | Gly | Ala | Leu |
| | | 290 | | | | 295 | | | | | 300 | | | | |
| Ile | Gly | Val | Met | Cys | Val | Leu | Ile | Arg | Val | Val | Asn | Pro | Ala | Tyr | Pro |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Glu | Gly | Met | Met | Leu | Ala | Ile | Leu | Phe | Ala | Asn | Leu | Phe | Ala | Pro | Ile |

325

330

335

Phe Asp Tyr Phe Val Ala Gln Ala Asn Ile Lys Arg Arg Lys Ala Arg
 340 345 350

Ser Asn Gly
 355

<210> 2033

<211> 441

<212> DNA

<213> Neisseria gonorrhoeae

<400> 2033

atgacccggc gacgggtcgg caagcaaaac cgtattgcc a tccactccgc gcaataccga 60
 aaaatggtcg tctttgcggt atttcagata cacgatgacg gggattttca actgcgcgag 120
 ctgttcgaaa gacagggcat agcctttcgc ctcaaaaccc aaatcgggca taatgcgcgcg 180
 catatcctca aacgacgcgc gcatctgttc cttaccocagt ttttccaaca cttcttcttc 240
 cgtcagcttt tgcccgtaaa aattgttcaa aagcgctgcc accgaagccg cccgcgagga 300
 aaaatccaaa tcctgcttta caatattgaa atcccgccgc gctttccaac tctgcaattt 360
 gatttttccg taaacaacag gattatcggt aaacatcggt gcagcattca aacgataaga 420

caagggtctg taccagatta g

441

<210> 2034

<211> 146

<212> PRT

<213> Neisseria gonorrhoeae

<400> 2034

Met Thr Arg Arg Val Gly Lys Gln Asn Arg Ile Ala Ile His Ser
 1 5 10 15

Ala Gln Tyr Arg Lys Met Val Val Phe Ala Val Phe Gln Ile His Asp
 20 25 30

Asp Gly Asp Phe Gln Leu Arg Glu Leu Phe Glu Arg Gln Gly Ile Ala
 35 40 45

Phe Arg Leu Lys Thr Gln Ile Gly His Asn Ala Pro His Ile Leu Lys
 50 55 60

Arg Arg Ala His Leu Phe Leu Thr Gln Phe Phe Gln His Phe Phe Phe
 65 70 75 80

Arg Gln Leu Leu Pro Val Lys Ile Val Gln Lys Arg Arg His Arg Ser
 85 90 95

Arg Pro Ala Gly Lys Ile Gln Ile Leu Leu Tyr Asn Ile Glu Ile Pro
 100 105 110

Pro Arg Phe Pro Thr Leu Gln Phe Asp Phe Ser Val Asn Asn Arg Ile
 115 120 125

Ile Val Lys His Arg Cys Ser Ile Gln Thr Ile Arg Gln Gly Ser Val

130

135

140

Pro Asp
145

<210> 2035

<211> 396

<212> DNA

<213> Neisseria meningitidis

<400> 2035

```

atgacccagc gacgggtcgg caagcaaaac cgtattgccg tctataccgc gcaataccga 60
gaaatgatca tccttgccgt atttcagata cacgatgacg gggatttgca actgtgcaag 120
ctgctcgaaa gacagggcat agcctttcgc ttcaaaaccc aaatcaggca taatgcgccg 180
catatcctca aacgacgcgg gcacctgctc cttatccagt tttttaaca cgtcctcttc 240
cgtcagcttt tgcccgtaaa aattgttcaa aagcgtcacc accgaagccg cccgcagga 300
aaaatccaaa tcctgcttta caatattgaa atcgcgcctt tctttccaac tctgcacttt 360
gatttttcca taagcaacag gattatagtg gattaa                               396

```

<210> 2036

<211> 130

<212> PRT

<213> Neisseria meningitidis

<400> 2036

```

Met Thr Gln Arg Arg Val Gly Lys Gln Asn Arg Ile Ala Val Tyr Thr
  1              5              10              15

Ala Gln Tyr Arg Glu Met Ile Ile Leu Ala Val Phe Gln Ile His Asp
      20              25              30

Asp Gly Asp Leu Gln Leu Cys Lys Leu Leu Glu Arg Gln Gly Ile Ala
      35              40              45

Phe Arg Phe Lys Thr Gln Ile Arg His Asn Ala Pro His Ile Leu Lys
      50              55              60

Arg Arg Gly His Leu Leu Leu Ile Gln Phe Phe His Val Leu Phe Arg
      65              70              75              80

Gln Leu Leu Pro Val Lys Ile Val Gln Lys Arg His His Arg Ser Arg
      85              90              95

Pro Ala Gly Lys Ile Gln Ile Leu Leu Tyr Asn Ile Glu Ile Ala Pro
      100             105             110

Phe Phe Pro Thr Leu His Phe Asp Phe Ser Ile Ser Asn Arg Ile Ile
      115             120             125

Val Asp
      130

```

<210> 2037

<211> 396

<212> DNA
<213> *Neisseria meningitidis*

<400> 2037
atgacccagc gacgggtcgg caagcaaaac cgtattgccg tctataccgc gcaataaccga 60
gaaatgatca tccttgcggg atttcagata cacgatgacg gggatttgca actgtgcaag 120
ctgctcgaaa gacagggcat agcctttcgc ctcaaaaccc aaatcaggca tgatgcgccg 180
catatcctca aacgacgcgc gcacctgctc cttatccagc tttttcaaca cgtcctcttc 240
cgtcagcttt tgcccgtgaa aattgttcaa aagcgtgcc accgaagccg ccccgagga 300
aaaatccaaa tcctgcttta caatattgaa atcgcgcctt tctttccaac tctgcacttt 360
gatttttcca taagcaacag gattatagt gattaa 396

<210> 2038
<211> 131
<212> PRT
<213> *Neisseria meningitidis*

<400> 2038
Met Thr Gln Arg Arg Val Gly Lys Gln Asn Arg Ile Ala Val Tyr Thr
1 5 10 15
Ala Gln Tyr Arg Glu Met Ile Ile Leu Ala Val Phe Gln Ile His Asp
20 25 30
Asp Gly Asp Leu Gln Leu Cys Lys Leu Leu Glu Arg Gln Gly Ile Ala
35 40 45
Phe Arg Leu Lys Thr Gln Ile Arg His Asp Ala Pro His Ile Leu Lys
50 55 60
Arg Arg Ala His Leu Leu Leu Ile Gln Leu Phe Gln His Val Leu Phe
65 70 75 80
Arg Gln Leu Leu Pro Val Lys Ile Val Gln Lys Arg Arg His Arg Ser
85 90 95
Arg Pro Ala Gly Lys Ile Gln Ile Leu Leu Tyr Asn Ile Glu Ile Ala
100 105 110
Pro Phe Phe Pro Thr Leu His Phe Asp Phe Ser Ile Ser Asn Arg Ile
115 120 125
Ile Val Asp
130

<210> 2039
<211> 996
<212> DNA
<213> *Neisseria gonorrhoeae*

<400> 2039
atgattggcg gacagtttat cgtagttaggc attgtaggca aaaacgcact tgcccgttt 60
gttgataata ttgtcgtgaa tctcggaata gttgacatag ttgagcatga tgccctaata 120
gcccgtgccg acggcgatat tgtcgaacac tttgagccgt tcggaaaaca tcagcacata 180
gcccattatt ttgccacagg aaataattgcc gctgacttcg ctgtcgttgg tgtacatata 240

```

gtggacggcg aaacgcaggt cgctgaagcg gttgttttta taggtgttgt gcgtgctggt 300
attggaaaaa atgccgtccc gccctttgga aatgtcgttg ccgacgacct gcgcgccggg 360
cgcgttccaa acggtaacgc cattgccgcg ctcatcacg cgcaaggtcg catcgccgac 420
gattttattc tcgcgcacca tcgcatcggc agaaccatga aggtatacgc cgaacgaatt 480
atcaaaaaata ttgttgtgtt caaccagggc gcgcggggcg gctttttcga gataaatacc 540
ggcatccatt gctggcaggc tcataccgga acgggtaacg gtcagggttg gcgagcgttac 600
gtccggcgcg tgtacggcta tggtagccc gctcttggtc ccttcgatgg ttgcggaacg 660
gtcggcaggc ccttcaatcg taatcggttt gtcgatataa agtttggttt gatatacgcc 720
ggaagccagt ttgatcgtat cgcccgcccg ggcgcgggca aaaatttcgg caaggttgtc 780
ttgcggggaa acgtggacga cggctgccga tgccgtctga aaaatgctgc cggcggcaag 840
tatcagcacg gccttcagcc atatacgag cgcggatgtg tgcatagtgt ccctctgttt 900
cgttcggtat ggccgaacaa aataaagcat cattcaaattg tgctgtttt tatagcgaaa 960
ccgcctgaaa cggtacggca agcggtttgg ctataa 996

```

<210> 2040

<211> 331

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 2040

```

Met Ile Gly Gly Gln Phe Ile Val Val Gly Ile Val Gly Lys Asn Ala
  1             5             10             15

Leu Ala Arg Phe Val Asp Asn Ile Val Val Asn Ile Gly Ile Val Asp
      20             25             30

Ile Val Glu His Asp Ala Leu Ile Ala Ala Ala Asp Gly Asp Ile Val
      35             40             45

Glu His Phe Glu Pro Phe Gly Lys His Gln His Ile Ala His Ile Val
      50             55             60

Ala His Gly Asn Ile Ala Ala Asp Phe Ala Val Val Gly Val His Ile
      65             70             75             80

Val Asp Gly Glu Thr Gln Val Ala Glu Ala Val Val Phe Ile Gly Val
      85             90             95

Val Arg Ala Gly Ile Gly Lys Asn Ala Val Pro Pro Phe Gly Asn Val
      100            105            110

Val Ala Asp Asp Leu Arg Ala Gly Arg Val Pro Asn Gly Asn Ala Ile
      115            120            125

Ala Ala Leu Ile His Ala Gln Gly Arg Ile Ala Asp Asp Phe Ile Leu
      130            135            140

Ala His His Arg Ile Gly Arg Thr Met Lys Val Tyr Ala Glu Arg Ile
      145            150            155            160

Ile Lys Asn Ile Val Val Phe Asn Gln Gly Ala Arg Gly Gly Phe Phe
      165            170            175

Glu Ile Asn Thr Gly Ile His Cys Trp Gln Ala His Thr Gly Thr Gly
      180            185            190

```

Asn Gly Gln Val Ala Glu Arg Tyr Val Arg Arg Val Tyr Gly Tyr Gly
 195 200 205
 Thr Pro Ala Leu Val Pro Phe Asp Gly Cys Gly Thr Val Gly Arg Pro
 210 215 220
 Phe Asn Arg Asn Arg Phe Val Asp Ile Lys Phe Gly Leu Ile Tyr Ala
 225 230 235 240
 Gly Ser Gln Phe Asp Arg Ile Ala Arg Pro Gly Ala Gly Lys Asn Phe
 245 250 255
 Gly Lys Val Val Leu Arg Gly Asn Val Asp Asp Gly Cys Arg Cys Arg
 260 265 270
 Leu Lys Asn Ala Ala Gly Gly Lys Tyr Gln His Gly Leu Gln Pro Tyr
 275 280 285
 Thr Glu Arg Gly Cys Val His Ser Val Pro Leu Phe Arg Ser Val Trp
 290 295 300
 Pro Asn Lys Ile Lys His His Ser Asn Val Pro Val Phe Ile Ala Lys
 305 310 315 320
 Pro Pro Glu Thr Val Arg Gln Ala Val Trp Leu
 325 330

<210> 2041
 <211> 795
 <212> DNA
 <213> *Neisseria meningitidis*

<400> 2041
 atgattggcg aaaagtttat cgtagttggc attataggca aatacgcact tgcctgcctt 60
 gttgataatg ttgtcgtgaa tatcggaata gttgacatag ttgagcataa tgccctgac 120
 gcggctgccg acggcgatat tgtcgaatac tttgagccgc tcggaaaaca tcagcacata 180
 gcccatattg ttgccacagg aaatattgcc gctgatttcg ctgtcgttgg tgtacatata 240
 gtggacggcg aaacgcaaat cgctgaagcg gttgtttttg taggtgttgt gcgtgctgg 300
 attggaaaaa atgccgtccc gccctttgga aatgtcgttg ccgacgacct gcgcaccggg 360
 tgcgttccaa acggtaacgc cgttgccgcg ctgcgttcacg cgcaaagtcg cgtcgccgac 420
 gattttattc tcgcgcacca tcgcatcggc agaaccatgc agatatacgc cgaccgaatt 480
 atccaaaata ttgttgtgtt caatcagggc gcgcggggca gtttcttcga gataaatacc 540
 ggcattccatt gcgggcaggc tcataccgga acgggtaacg gtcagggttc ggagcgttac 600
 gtccggcgcg tgtacggcta tggtagcccc gtcctgtcg ccttcgatgg ttgcggaacg 660
 gtcggcaggc cttcaatcg taatcggttt gtcaatgtga agtttggttt tatatacgcc 720
 ggaagccagt ttgagcgtat cgcgcggcgc ggcgcgggca aatgcgggat accgatcagc 780
 ataatcggtt cgtga 795

<210> 2042
 <211> 264
 <212> PRT
 <213> *Neisseria meningitidis*

<400> 2042
 Met Ile Gly Glu Lys Phe Ile Val Val Gly Ile Ile Gly Lys Tyr Ala

| | | | |
|-------------|-------------------------|---------------------|-------------|
| 1 | 5 | 10 | 15 |
| Leu Ala Cys | Leu Val Asp Asn Val | Val Val Asn Ile Gly | Ile Val Asp |
| 20 | 25 | 30 | |
| Ile Val Glu | His Asn Ala Leu Ile | Ala Ala Ala Asp Gly | Asp Ile Val |
| 35 | 40 | 45 | |
| Glu Tyr Phe | Glu Pro Leu Gly Lys His | Gln His Ile Ala His | Ile Val |
| 50 | 55 | 60 | |
| Ala His Gly | Asn Ile Ala Ala Asp Phe | Ala Val Val Gly Val | His Ile |
| 65 | 70 | 75 | 80 |
| Val Asp Gly | Glu Thr Gln Ile Ala Glu | Ala Val Val Phe Val | Gly Val |
| 85 | 90 | 95 | |
| Val Arg Ala | Gly Ile Gly Lys Asn Ala | Val Pro Pro Phe Gly | Asn Val |
| 100 | 105 | 110 | |
| Val Ala Asp | Asp Leu Arg Thr Gly Cys | Val Pro Asn Gly Asn | Ala Val |
| 115 | 120 | 125 | |
| Ala Ala Leu | Val His Ala Gln Ser Arg | Val Ala Asp Asp Phe | Ile Leu |
| 130 | 135 | 140 | |
| Ala His His | Arg Ile Gly Arg Thr Met | Gln Ile Tyr Ala Asp | Arg Ile |
| 145 | 150 | 155 | 160 |
| Ile Gln Asn | Ile Val Val Phe Asn Gln | Gly Ala Arg Gly Ser | Phe Phe |
| 165 | 170 | 175 | |
| Glu Ile Asn | Thr Gly Ile His Cys Gly | Gln Ala His Thr Gly | Thr Gly |
| 180 | 185 | 190 | |
| Asn Gly Gln | Val Ala Glu Arg Tyr Val | Arg Arg Val Tyr Gly | Tyr Gly |
| 195 | 200 | 205 | |
| Thr Pro Ala | Pro Val Ala Phe Asp Gly | Cys Gly Thr Val Gly | Arg Pro |
| 210 | 215 | 220 | |
| Phe Asn Arg | Asn Arg Phe Val Asn Val | Lys Phe Gly Phe Ile | Tyr Ala |
| 225 | 230 | 235 | 240 |
| Gly Ser Gln | Phe Glu Arg Ile Ala Arg | Pro Gly Ala Gly Lys | Cys Gly |
| 245 | 250 | 255 | |
| Ile Pro Ile | Ser Ile Ile Gly Ser | | |
| 260 | | | |

<210> 2043

<211> 798

<212> DNA

<213> Neisseria meningitidis

<400> 2043

```

atgattggcg gacagtttat cgtagttaggc attgtaggca aaaacgcact tgcccgttt 60
gttgataatg ttgtcgtgaa tatcggaata gttgacatag ttgagcatga tgccttggtc 120
gcgggtgccg acggcgatat tgtcaaacac tttgagccgc tcggaaaaca tcagcacata 180
gcccataattg ttgcccacgg aaatattgcc gctgatttcg ctgtcgttgg tgtacatata 240
gtggacggcg aaacgcaaat cgctgaagcg gttgttttta taggtgttgt gcgtgctggt 300
attggaaaaa atgccgtccc gccctttgga aatatcgttg ccgacgacct gcgcgccggg 360
cgcgttccaa acggtaacgc cattgccgcg ctcgttcacg cgcaaagtcg cgtcgccgac 420
gattttattc tcccgcacca tcgcatcggc agaaccatgc agatagacgc cgaccgaatt 480
atccaaaata ttatttgtgt caatcagggc gcgcggggca gtttcttcga gataaatacc 540
ggcatccatt gcgggcaggc tcataccgga acgggtaacg gtcaggttgc ggagcgttac 600
gtccggcgcg tgtacggcta tggtaagccc gtcctgtct ccttcgatgg ttgcagaacg 660
gtcggcaggc ccttcaatcg taatcggttt gtcgatgtga agtttggtt gatatacgcc 720
ggaagccagt ttgagcgtat cgcccgcgcg ggcgcgggca aatgcgggat accgatcagc 780
ataatcgact catggtga 798

```

<210> 2044

<211> 265

<212> PRT

<213> Neisseria meningitidis

<400> 2044

```

Met Ile Gly Gly Gln Phe Ile Val Val Gly Ile Val Gly Lys Asn Ala
  1             5             10             15

```

```

Leu Ala Arg Phe Val Asp Asn Val Val Val Asn Ile Gly Ile Val Asp
          20             25             30

```

```

Ile Val Glu His Asp Ala Leu Val Ala Ala Ala Asp Gly Asp Ile Val
      35             40             45

```

```

Lys His Phe Glu Pro Leu Gly Lys His Gln His Ile Ala His Ile Val
      50             55             60

```

```

Ala His Gly Asn Ile Ala Ala Asp Phe Ala Val Val Gly Val His Ile
      65             70             75             80

```

```

Val Asp Gly Glu Thr Gln Ile Ala Glu Ala Val Val Phe Ile Gly Val
          85             90             95

```

```

Val Arg Ala Gly Ile Gly Lys Asn Ala Val Pro Pro Phe Gly Asn Ile
      100             105             110

```

```

Val Ala Asp Asp Leu Arg Ala Gly Arg Val Pro Asn Gly Asn Ala Ile
      115             120             125

```

```

Ala Ala Leu Val His Ala Gln Ser Arg Val Ala Asp Asp Phe Ile Leu
      130             135             140

```

```

Pro His His Arg Ile Gly Arg Thr Met Gln Ile Asp Ala Asp Arg Ile
      145             150             155             160

```

```

Ile Gln Asn Ile Ile Val Phe Asn Gln Gly Ala Arg Gly Ser Phe Phe
      165             170             175

```

```

Glu Ile Asn Thr Gly Ile His Cys Gly Gln Ala His Thr Gly Thr Gly
      180             185             190

```

Asn Gly Gln Val Ala Glu Arg Tyr Val Arg Arg Val Tyr Gly Tyr Gly
 195 200 205

Thr Pro Ala Pro Val Ser Phe Asp Gly Cys Arg Thr Val Gly Arg Pro
 210 215 220

Phe Asn Arg Asn Arg Phe Val Asp Val Lys Phe Gly Leu Ile Tyr Ala
 225 230 235 240

Gly Ser Gln Phe Glu Arg Ile Ala Arg Pro Gly Ala Gly Lys Cys Gly
 245 250 255

Ile Pro Ile Ser Ile Ile Asp Ser Trp
 260 265

<210> 2045
 <211> 1035
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 2045
 atgagcctgc cagcaatgga tgccggtatt tatctcgaaa aagccgcccc gcgcgcacctg 60
 gttgaacaca acaatatttt tgataattcg ttcggcggtat accttcatgg ttctgccgat 120
 gcgatggtgc gcgagaataa aatcgtcggc gatgcgacct tgcgcggtgaa tgagcgcggc 180
 aatggcggtta ccgttttgaa cgcgcccggc gcgcaggtcg tcggcaacga catttccaaa 240
 gggcgggacg gcattttttc caataccagc acgcacaaca cctataaaaa caaccgcttc 300
 agcgacctgc gtttcgccgt ccaactatat tacaccaacg acagcgaagt cagcggcaat 360
 atttccgtgg gcaacaatat gggctatgtg ctgatgtttt ccgaacggct caaagtgttc 420
 gacaatatcg ccgtcggcag ccgcgattag ggcacatcatgc tcaactatgt caactattcc 480
 gatattcacg acaatattat caacaaagcg ggcaagtgcg tttttgccta caatgccaac 540
 tacgataaac tgtccgccaa tcattttgaa aactgccaaa tcggcatgca ctttaccgcc 600
 gccatcgaag gcacgtccct gcacgacaat tcctttatca acaacggaag ccaggtcaaa 660
 tatgtcagta cgcgctttct cgactggagc gagggcggac acggcaacta ctggagcgac 720
 aacagcccgt tcgatttgaa cggcgacggc ttcggagaca gcgcgtaccg tcccgcggc 780
 atcatcgacc aaatcatctg gcgcgcgccc gtatcgcgcc tcttgatgaa cagtcccgca 840
 atcagcatcg tcaaattggg gcaggcgagc tttcccgccg ttctgcccgg cggcggtggtg 900
 gacagcaaac cgctgatgaa gccttatgcc cccaaaattc aaacccgta tcaggcgatg 960
 aaggacgagt tgctcaaaga agccgaaacg cggcagtcgg aacggggcag ggcggaac 1020
 gggtctttga actag 1035

<210> 2046
 <211> 343
 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 2046
 Met Ser Leu Pro Ala Met Asp Ala Gly Ile Tyr Leu Glu Lys Ala Ala
 1 5 10 15

Pro Arg Ala Leu Val Glu His Asn Asn Ile Phe Asp Asn Ser Phe Gly
 20 25 30

Val Tyr Leu His Gly Ser Ala Asp Ala Met Val Arg Glu Asn Lys Ile
 35 40 45

Val Gly Asp Ala Thr Leu Arg Val Asn Glu Arg Gly Asn Gly Val Thr
50 55 60

Val Trp Asn Ala Pro Gly Ala Gln Val Val Gly Asn Asp Ile Ser Lys
65 70 75 80

Gly Arg Asp Gly Ile Phe Ser Asn Thr Ser Thr His Asn Thr Tyr Lys
85 90 95

Asn Asn Arg Phe Ser Asp Leu Arg Phe Ala Val His Tyr Met Tyr Thr
100 105 110

Asn Asp Ser Glu Val Ser Gly Asn Ile Ser Val Gly Asn Asn Met Gly
115 120 125

Tyr Val Leu Met Phe Ser Glu Arg Leu Lys Val Phe Asp Asn Ile Ala
130 135 140

Val Gly Ser Arg Asp Gly Ile Met Leu Asn Tyr Val Asn Tyr Ser Asp
145 150 155 160

Ile His Asp Asn Ile Ile Asn Lys Ala Gly Lys Cys Val Phe Ala Tyr
165 170 175

Asn Ala Asn Tyr Asp Lys Leu Ser Ala Asn His Phe Glu Asn Cys Gln
180 185 190

Ile Gly Met His Phe Thr Ala Ala Ile Glu Gly Thr Ser Leu His Asp
195 200 205

Asn Ser Phe Ile Asn Asn Gly Ser Gln Val Lys Tyr Val Ser Thr Arg
210 215 220

Phe Leu Asp Trp Ser Glu Gly Gly His Gly Asn Tyr Trp Ser Asp Asn
225 230 235 240

Ser Pro Phe Asp Leu Asn Gly Asp Gly Phe Gly Asp Ser Ala Tyr Arg
245 250 255

Pro Asp Gly Ile Ile Asp Gln Ile Ile Trp Arg Ala Pro Val Ser Arg
260 265 270

Leu Leu Met Asn Ser Pro Ala Ile Ser Ile Val Lys Trp Ala Gln Ala
275 280 285

Gln Phe Pro Ala Val Leu Pro Gly Gly Val Val Asp Ser Lys Pro Leu
290 295 300

Met Lys Pro Tyr Ala Pro Lys Ile Gln Thr Arg Tyr Gln Ala Met Lys
305 310 315 320

Asp Glu Leu Leu Lys Glu Ala Glu Thr Arg Gln Ser Glu Arg Gly Arg
325 330 335

Ala Glu Asn Gly Ser Leu Asn
340

<210> 2047
 <211> 1035
 <212> DNA
 <213> Neisseria meningitidis

<400> 2047
 atgagcctgc cgcgaatgga tgccgggtatt tatctcgaag aaactgcccc gcgcgccttg 60
 attgaacaça acaatatttt ggataattcg gtcggcggtat atctgcatgg ttctgccgat 120
 gcgatggtgc gcgagaataa aatcgtcggc gacgcgactt tgcgcggtgaa cgagcgcggc 180
 aacggcggtta cggtttgga cgcacccggg ggcgagggtcg tcggcaacga catttccaaa 240
 gggcggggacg gcattttttc caataccagc acgcacaaca cctacaaaaa caaccgcttc 300
 agcgatttgc gtttcgccgt ccactatatg tacaccaacg acagcgaaat cagcggcaat 360
 atttcogtgg gcaacaatat gggctatgtg ctgatgtttt ccgagcggct caaagtattc 420
 gacaatatcg ccgtcggcag ccgcgatcag ggcattatgc tcaactatgt caactattcc 480
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 tacgataaac ttttcgccaa tcattttgaa aactgtcaaa tcggcataca ctttaccgcc 600
 gccatcgaag gcacgtcctt gcatgacaat tcctttatca acaacgaaag ccaggtcaaa 660
 tacgtcagca cgcgctttct cgattggagc gagggcggac acggcaacta ttggagcgac 720
 aacagcgcggt tcgatttgaa cggcgacggc ttccggagaca gcgcgtaccg cccaacggc 780
 atcatcgacc aaatcatctg gcgcgcgcc gtatcgcgcc ttttgatgaa cagtcccgca 840
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 gacagcaaac cgctgatgaa gccttatgcc cccaaaattc aaaccogtta tcaggcgatg 960
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<210> 2048
 <211> 344
 <212> PRT
 <213> Neisseria meningitidis

<400> 2048
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 20 25 30
 Val Tyr Leu His Gly Ser Ala Asp Ala Met Val Arg Glu Asn Lys Ile
 35 40 45
 Val Gly Asp Ala Thr Leu Arg Val Asn Glu Arg Gly Asn Gly Val Thr
 50 55 60
 Val Trp Asn Ala Pro Gly Ala Gln Val Val Gly Asn Asp Ile Ser Lys
 65 70 75 80
 Gly Arg Asp Gly Ile Phe Ser Asn Thr Ser Thr His Asn Thr Tyr Lys
 85 90 95
 Asn Asn Arg Phe Ser Asp Leu Arg Phe Ala Val His Tyr Met Tyr Thr
 100 105 110
 Asn Asp Ser Glu Ile Ser Gly Asn Ile Ser Val Gly Asn Asn Met Gly
 115 120 125

Tyr Val Leu Met Phe Ser Glu Arg Leu Lys Val Phe Asp Asn Ile Ala
 130 135 140
 Val Gly Ser Arg Asp Gln Gly Ile Met Leu Asn Tyr Val Asn Tyr Ser
 145 150 155 160
 Asp Ile His Asp Asn Ile Ile Asn Lys Ala Gly Lys Cys Val Phe Ala
 165 170 175
 Tyr Asn Ala Asn Tyr Asp Lys Leu Phe Ala Asn His Phe Glu Asn Cys
 180 185 190
 Gln Ile Gly Ile His Phe Thr Ala Ala Ile Glu Gly Thr Ser Leu His
 195 200 205
 Asp Asn Ser Phe Ile Asn Asn Glu Ser Gln Val Lys Tyr Val Ser Thr
 210 215 220
 Arg Phe Leu Asp Trp Ser Glu Gly Gly His Gly Asn Tyr Trp Ser Asp
 225 230 235 240
 Asn Ser Ala Phe Asp Leu Asn Gly Asp Gly Phe Gly Asp Ser Ala Tyr
 245 250 255
 Arg Pro Asn Gly Ile Ile Asp Gln Ile Ile Trp Arg Ala Pro Val Ser
 260 265 270
 Arg Leu Leu Met Asn Ser Pro Ala Ile Ser Ile Val Lys Trp Ala Gln
 275 280 285
 Ala Gln Phe Pro Ala Val Leu Pro Gly Gly Val Val Asp Ser Lys Pro
 290 295 300
 Leu Met Lys Pro Tyr Ala Pro Lys Ile Gln Thr Arg Tyr Gln Ala Met
 305 310 315 320
 Lys Asp Glu Leu Leu Lys Glu Val Glu Thr Arg Gln Ser Glu Trp Gly
 325 330 335
 Arg Ala Glu Asn Gly Ser Leu Asn
 340

<210> 2049

<211> 1035

<212> DNA

<213> Neisseria meningitidis

<400> 2049

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 gcgatggtgc gggagaataa aatcgctcggc gacgcgactt tgcgcgtgaa cgagcgcggc 180
 aatggcggtta ccgttttgaa cgcgcccggc gcgcaggctc tcggcaacga tatttccaaa 240
 gggcgggacg gcattttttc caataccagc acgcacaaca cctataaaaa caaccgcttc 300
 agcgatttgc gtttcgccgt ccactatatg tacaccaacg acagcgaaat cagcggcaat 360
 atttccgtgg gcaacaatat gggctatgtg ctgatgtttt ccgagcggct caaagtgttt 420

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gacaatatcg ccgtcggcag ccgcgaccaa ggcacatgc tcaactatgt caactattcc 480
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tacgataaac tgtccgccaa tcattttgaa aactgccaaa tcggcataca ctttaccgcc 600
gccatcgaag gcacgtccct gcacgacaat tcctttatca acaacgaaag ccaggtcaaa 660
tacgtcagca cgcgctttct cgactggagc gagggcggac acggcaacta ttggagcgac 720
aacagcgcgt tcgatttgaa cggcgacggc ttcggagaca gcgcgtaccg tcccaacggc 780
atcatcgacc aaatcatctg gcgcgcaccc gtatcgcgcc tcttgatgaa cagtcccga 840
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<210> 2050

<211> 344

<212> PRT

<213> *Neisseria meningitidis*

<400> 2050

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Pro Arg Ala Leu Ile Glu His Asn Asn Ile Leu Asp Asn Ser Val Gly
      20             25             30

Val Tyr Leu His Gly Ser Ala Asp Ala Met Val Arg Glu Asn Lys Ile
      35             40             45

Val Gly Asp Ala Thr Leu Arg Val Asn Glu Arg Gly Asn Gly Val Thr
      50             55             60

Val Trp Asn Ala Pro Gly Ala Gln Val Val Gly Asn Asp Ile Ser Lys
      65             70             75             80

Gly Arg Asp Gly Ile Phe Ser Asn Thr Ser Thr His Asn Thr Tyr Lys
      85             90             95

Asn Asn Arg Phe Ser Asp Leu Arg Phe Ala Val His Tyr Met Tyr Thr
      100            105            110

Asn Asp Ser Glu Ile Ser Gly Asn Ile Ser Val Gly Asn Asn Met Gly
      115            120            125

Tyr Val Leu Met Phe Ser Glu Arg Leu Lys Val Phe Asp Asn Ile Ala
      130            135            140

Val Gly Ser Arg Asp Gln Gly Ile Met Leu Asn Tyr Val Asn Tyr Ser
      145            150            155            160

Asp Ile His Asp Asn Ile Ile Asn Lys Ala Gly Lys Cys Val Phe Ala
      165            170            175

Tyr Asn Ala Asn Tyr Asp Lys Leu Ser Ala Asn His Phe Glu Asn Cys
      180            185            190

Gln Ile Gly Ile His Phe Thr Ala Ala Ile Glu Gly Thr Ser Leu His
      195            200            205

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Asp Asn Ser Phe Ile Asn Asn Glu Ser Gln Val Lys Tyr Val Ser Thr
 210 215 220
 Arg Phe Leu Asp Trp Ser Glu Gly Gly His Gly Asn Tyr Trp Ser Asp
 225 230 235 240
 Asn Ser Ala Phe Asp Leu Asn Gly Asp Gly Phe Gly Asp Ser Ala Tyr
 245 250 255
 Arg Pro Asn Gly Ile Ile Asp Gln Ile Ile Trp Arg Ala Pro Val Ser
 260 265 270
 Arg Leu Leu Met Asn Ser Pro Ala Ile Ser Ile Val Lys Trp Ala Gln
 275 280 285
 Ala Gln Phe Pro Ala Val Leu Pro Gly Gly Val Val Asp Ser Lys Pro
 290 295 300
 Leu Met Lys Pro Tyr Ala Pro Lys Ile Gln Thr Arg Tyr Gln Ala Met
 305 310 315 320
 Lys Asp Gly Leu Leu Lys Lys Val Glu Thr Arg Gln Leu Glu Trp Gly
 325 330 335
 Arg Ala Glu Asn Gly Ser Leu Asn
 340

<210> 2051

<211> 1191

<212> DNA

<213> Neisseria gonorrhoeae

<400> 2051

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 gtctttttga cggcggcact gcccgcttat gcggagcgtc tgcctgattt tctggcgaaa 180
 atacagcctt cggaaatttt tccgggtgcg gatcgttacg gcaagccgga aggcaagcct 240
 atggttgccc gcgtttacaa aggcgatgag cagctcgggt tggtttatat cacgaccgat 300
 gcggtcaata cgcgcggtta ttcgagcaaa ccgatcgata cgctgatggc tttggcaaac 360
 gacggcacga tagccggggc gaaactggtc gatcatcacg aaccgattat gctgatcgg 420
 atcccgaat cgcgtgtcga taagtccatc gacaaatata tcggtctgaa ttttattaaa 480
 aatccgccga ccccgagcgt ggcgcggggc gacatcatca gcggtgacgac tgttacactg 540
 atggttggtta acgacagcat ccagcgttcg tacaagggtca ttgccaacca ataccgtctg 600
 gggttcggaca aggcccttca gacggcatcc gcttccgatg ttcgggaagc cgcgcctgcg 660
 tcagaaaccc gtccgcgccg tatggcaaat cccgacaagc aggatatttt gtcttggggac 720
 gaacttttga aacaaaaggc cgtcggccat ctgcatatca cgctcgatca aatcaacaaa 780
 ctgtttgaga aaggcggcaa ggccggcgtg gccgatcacg ccgaacaggg cgatcctgac 840
 gataccttta ttgatttga tgttgccctg gtcagccagc cttccatcgg taaaagcctg 900
 ctgggtgagg acggtctggc gcatctgcaa aaacggctga aaccggggca gcaggcgggt 960
 ttggttgccg gagagggccg ttattccttg aaaggttcgg gctatgtgac cggcgggtatt 1020
 ttcgaccgta tcgagatgat tcagggggag aacagcttcc gttttaccga tgcccaacac 1080
 gaacgcgtcg tcgagctgtc tgccgccgat gcgcgcggtt ttaaagaagt ttcttggttt 1140
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<210> 2052
<211> 396
<212> PRT
<213> Neisseria gonorrhoeae

<400> 2052
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Ala Met Ser Cys Phe Ser Ile Arg Arg Met Ser Ala Phe Arg Ala Arg
20 25 30
Ile Thr Ala Phe Phe Thr Ala Phe Val Phe Leu Thr Ala Ala Leu Pro
35 40 45
Ala Tyr Ala Glu Arg Leu Pro Asp Phe Leu Ala Lys Ile Gln Pro Ser
50 55 60
Glu Ile Phe Pro Gly Ala Asp Arg Tyr Gly Lys Pro Glu Gly Lys Pro
65 70 75 80
Met Val Ala Arg Val Tyr Lys Gly Asp Glu Gln Leu Gly Leu Val Tyr
85 90 95
Ile Thr Thr Asp Ala Val Asn Thr Arg Gly Tyr Ser Ser Lys Pro Ile
100 105 110
Asp Thr Leu Met Ala Leu Ala Asn Asp Gly Thr Ile Ala Gly Ala Lys
115 120 125
Leu Val Asp His His Glu Pro Ile Met Leu Ile Gly Ile Pro Gln Ser
130 135 140
Arg Val Asp Lys Phe Ile Asp Lys Tyr Ile Gly Leu Asn Phe Ile Lys
145 150 155 160
Asn Pro Pro Thr Pro Ser Val Ala Pro Gly Asp Ile Ile Ser Gly Ala
165 170 175
Thr Val Thr Leu Met Val Val Asn Asp Ser Ile Gln Arg Ser Tyr Lys
180 185 190
Val Ile Ala Asn Gln Tyr Arg Leu Gly Ser Asp Lys Ala Leu Gln Thr
195 200 205
Ala Ser Ala Ser Asp Val Arg Glu Ala Ala Pro Ala Ser Glu Thr Arg
210 215 220
Pro Arg Arg Met Ala Asn Pro Asp Lys Gln Asp Ile Leu Ser Trp Asp
225 230 235 240
Glu Leu Leu Lys Gln Lys Ala Val Gly His Leu His Ile Thr Leu Asp
245 250 255
Gln Ile Asn Lys Leu Phe Glu Lys Gly Gly Lys Ala Gly Val Ala Asp

| | | |
|---|-----|-----|
| 260 | 265 | 270 |
| His Ala Glu Gln Gly Asp Pro Asp Asp Thr Phe Ile Asp Leu Tyr Val | | |
| 275 | 280 | 285 |
| Ala Leu Val Ser Gln Pro Ser Ile Gly Lys Ser Leu Leu Gly Glu Asp | | |
| 290 | 295 | 300 |
| Gly Trp Ala His Leu Gln Lys Arg Leu Lys Pro Gly Gln Gln Ala Val | | |
| 305 | 310 | 315 |
| Leu Val Ala Gly Glu Gly Arg Tyr Ser Trp Lys Gly Ser Gly Tyr Val | | |
| 325 | 330 | 335 |
| Arg Gly Gly Ile Phe Asp Arg Ile Glu Met Ile Gln Gly Glu Asn Ser | | |
| 340 | 345 | 350 |
| Phe Arg Phe Thr Asp Ala Gln His Glu Arg Val Val Glu Leu Ser Ala | | |
| 355 | 360 | 365 |
| Ala Asp Ala Pro Arg Phe Lys Glu Val Ser Trp Phe Thr Ile Pro Glu | | |
| 370 | 375 | 380 |
| Gly Val Ala Phe Asp Gly Ala Glu Pro Trp Arg Leu | | |
| 385 | 390 | 395 |

<210> 2053
 <211> 429
 <212> DNA
 <213> Neisseria meningitidis

<400> 2053
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 gtctttttga cggcggcact gcccgtttat gcggagcgtc tgcttgattt tctggcgaaa 180
 atacagcctt cggaaatttt tccgggtgcg gaccgttacg gcaagccgga aggtaagcct 240
 atggttgccc gcgtttacaa aggcgatgag cagttgggct tggctctatat cacgaccgat 300
 gcggtcaata cgcgcggtta ttcgagcaaa ccgattgata cgctgatggt gttggcaaac 360
 gacggcacga tagccggggc gaaactggtc gaccatcacg aaccgattat gctgatcggg 420
 atcccgcacg 429

<210> 2054
 <211> 143
 <212> PRT
 <213> Neisseria meningitidis

<400> 2054
 Met Ile His Ile Ile Ser Ile Leu Lys Ser Ile Gly Ile Ser Gly Ile
 1 5 10 15
 Val Met Ser Cys Phe Ser Ile Lys Arg Met Ser Ala Phe Arg Ala Arg
 20 25 30
 Ile Thr Ala Phe Phe Ala Ala Phe Val Phe Leu Thr Ala Ala Leu Pro
 35 40 45

Ala Tyr Ala Glu Arg Leu Pro Asp Phe Leu Ala Lys Ile Gln Pro Ser
50 55 60

Glu Ile Phe Pro Gly Ala Asp Arg Tyr Gly Lys Pro Glu Gly Lys Pro
65 70 75 80

Met Val Ala Arg Val Tyr Lys Gly Asp Glu Gln Leu Gly Leu Val Tyr
85 90 95

Ile Thr Thr Asp Ala Val Asn Thr Arg Gly Tyr Ser Ser Lys Pro Ile
100 105 110

Asp Thr Leu Met Val Leu Ala Asn Asp Gly Thr Ile Ala Gly Ala Lys
115 120 125

Leu Val Asp His His Glu Pro Ile Met Leu Ile Gly Ile Pro His
130 135 140

<210> 2055

<211> 429

<212> DNA

<213> Neisseria meningitidis

<400> 2055

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gtctttttga cggcggcact gcccgcttat gcggagcgtc tgcctgattt tctggcgaaa 180
atacagcctt cggaaattgt tccgggtgcg gaccgttaca gcaagccgga aggtaagcct 240
atggttgccc gcgtttacaa aggcgatgag cagttgggct tgggtctatat cacgaccgat 300
gcggtcaata cgcgcggtta ttcgagcaaa ccgattgata cgctgatggc gttggctaaa 360
gacggtacga tagccggagc gaaattgggt gatcaccatg agtcgattat gctgatcgg 420
atcccgcat 429

<210> 2056

<211> 143

<212> PRT

<213> Neisseria meningitidis

<400> 2056

Met Ile His Ile Ile Ser Ile Leu Lys Ser Ile Gly Ile Ser Gly Ile
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Val Met Ser Cys Phe Ser Ile Lys Arg Met Ser Ala Phe Arg Ala Arg
20 25 30

Ile Thr Ala Phe Phe Ala Ala Phe Val Phe Leu Thr Ala Ala Leu Pro
35 40 45

Ala Tyr Ala Glu Arg Leu Pro Asp Phe Leu Ala Lys Ile Gln Pro Ser
50 55 60

Glu Ile Val Pro Gly Ala Asp Arg Tyr Ser Lys Pro Glu Gly Lys Pro
65 70 75 80

Met Val Ala Arg Val Tyr Lys Gly Asp Glu Gln Leu Gly Leu Val Tyr
85 90 95

Ile Thr Thr Asp Ala Val Asn Thr Arg Gly Tyr Ser Ser Lys Pro Ile
100 105 110

Asp Thr Leu Met Ala Leu Ala Lys Asp Gly Thr Ile Ala Gly Ala Lys
115 120 125

Leu Val Asp His His Glu Ser Ile Met Leu Ile Gly Ile Pro His
130 135 140

<210> 2057

<211> 1293

<212> DNA

<213> Neisseria gonorrhoeae

<400> 2057

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<210> 2058

<211> 430

<212> PRT

<213> Neisseria gonorrhoeae

<400> 2058

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Leu Leu Arg Arg Pro Lys Ser Ala Cys Arg Arg Ile Cys Pro Leu Ser
20 25 30

Ala Ile Ser Ala Val Gln Tyr Ile Phe Ala Asp Val Val Gln Gln Glu

| 35 | | | | | 40 | | | | | 45 | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Cys | Gly | Val | Phe | Val | Phe | Leu | Leu | Tyr | Glu | Asp | Lys | Lys | Ser | Gly |
| 50 | | | | | | 55 | | | | | 60 | | | | |
| Asp | Asp | Phe | Ala | Asp | Glu | Asp | Phe | Leu | Gln | Gly | Ala | Gly | Val | Gly | Gln |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gly | Val | Phe | Leu | Gln | Glu | Ala | Ala | Asp | Val | Phe | Gly | Gln | Ser | Val | Val |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ala | Gly | Asn | Gly | Gly | Lys | Ala | Asp | Ile | Gly | Leu | His | Gly | Val | Glu | Gln |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Gly | Leu | Val | Phe | Val | Gln | Leu | Asn | Ala | Cys | Phe | Phe | Phe | Phe | Gly | Gly |
| | 115 | | | | | | 120 | | | | | 125 | | | |
| Gly | Ala | Asp | Glu | Leu | Val | Val | Asn | Phe | Gly | Ile | Lys | His | Ile | Val | Arg |
| | 130 | | | | | | 135 | | | | | 140 | | | |
| Ala | Phe | Lys | Asn | Arg | Glu | Gly | Ala | Asp | Ile | Asp | Gly | Asp | Ile | Ala | Gly |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Trp | Val | Ser | Ala | Phe | Lys | Thr | Leu | Arg | Ala | Gln | Glu | Phe | Leu | Gln | His |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Leu | Arg | Gly | Gly | Val | Ser | Val | Phe | Arg | Gly | Glu | Gly | Phe | Asp | Asp | Val |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Arg | Leu | His | Gln | Leu | Met | Gly | Asp | Gly | Arg | Asp | Gly | Arg | Asn | Gly | Met |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Ala | Asp | Val | Ala | Val | Lys | Asp | Phe | Gly | Asn | Leu | Met | Ala | Ala | Leu | Asp |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Phe | Ala | Ala | Phe | Val | Ile | Asp | Glu | Ser | Asp | Ile | Val | Ala | Asp | Ile | Ser |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Val | Gln | Val | Val | Lys | Asp | Val | Phe | His | Asn | Ala | Val | Arg | His | Ala | Asp |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Gln | Leu | Gln | Ala | Ala | Ala | Asp | Lys | Asp | Val | Leu | Glu | Arg | Ala | Gln | Thr |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Gly | Ser | Val | Ala | Pro | Gly | Glu | Phe | His | His | Gly | Gly | Cys | Arg | His | Phe |
| | 275 | | | | | | 280 | | | | | 285 | | | |
| Gly | Ile | Asp | Ala | Val | Asp | Gly | Val | Thr | Asp | Gly | Ala | Gln | Ala | Phe | Gly |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Cys | Glu | Gly | Phe | Ala | Ala | Asp | Val | Cys | Phe | Gly | Asp | Glu | Gln | Gln | Val |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Asp | Asp | Phe | Gly | Glu | Phe | Ala | Val | Phe | Ala | Leu | Phe | Gly | Gly | Asn | Glu |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Glu | Glu | Val | Ala | Leu | Arg | Ile | Ala | Leu | Pro | Val | Phe | Arg | Gly | Val | Asp |

340

345

350

Val Asn Gly Leu Phe Val Gly Ile Phe Val Ala Gly Leu His Phe Ala
 355 360 365

Cys Asn Arg Arg Ala Gly Gly Phe Gly Phe Gly Asn Ala Gln Thr Ala
 370 375 380

Ala Phe Ala Phe Glu Asn His Val Gln Thr Leu Cys Asp Leu Arg Phe
 385 390 395 400

Ala Ala Glu Leu Leu Gln Arg Leu Gln His Gln Arg Ala Phe Asp Ala
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Gly Thr Gln Arg Asn Gly His Ala Val Met Pro Arg Asn Pro
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<210> 2059

<211> 1221

<212> DNA

<213> Neisseria meningitidis

<400> 2059

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<210> 2060

<211> 407

<212> PRT

<213> Neisseria meningitidis

<400> 2060

Ala Cys Arg Arg Ile Cys Pro Leu Pro Ala Ile Ser Ala Val Gln Tyr
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Ile Phe Ala Asp Val Val Gln Gln Glu Gly Cys Gly Val Phe Val Phe

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|---|---|---|---|--|--|--|---|--|--|--|--|---|--|--|--|--|---|---|--|--|--|
| Arg Leu Tyr Glu Asp Lys Glu Ser Gly Asp Asp Phe Ala Asp Lys Asp 35 40 45 | Phe Leu Gln Gly Ala Gly Ile Gly Gln Gly Val Phe Leu Gln Glu Ala 50 55 60 | Ala Asp Val Phe Arg Gln Ser Val Val Ala Gly Asp Gly Gly Lys Ala 65 70 75 80 | Gly Ile Gly Leu Gln Ala Val Glu Gln Gly Leu Val Phe Val Gln Leu 85 90 95 | His Ala Cys Phe Phe Phe Phe Gly Gly Gly Ala Asp Lys Leu Val Val 100 105 110 | Asn Phe Gly Ile Lys His Ile Val Arg Ala Phe Lys Asn Arg Glu Gly 115 120 125 | Ala Asp Val Asp Ser Asp Ile Ala Gly Gly Val Ser Ala Phe Lys Thr 130 135 140 | Leu Arg Thr Gln Glu Phe Leu Gln His Leu Arg Gly Gly Val Ser Val 145 150 155 160 | Phe Arg Gly Glu Gly Phe Asp Asp Val Arg Leu His Gln Leu Met Gly 165 170 175 | Asp Gly Gly Asn Arg Arg Asn Gly Met Ala Asp Val Ala Val Lys Asn 180 185 190 | Leu Gly Asn Leu Met Ala Ala Pro Asp Phe Ala Ala Phe Val Ile Asp 195 200 205 | Glu Phe Asp Val Val Ala Asp Val Ser Phe Gln Ile Phe Lys Asp Val 210 215 220 | Phe His Asn Ala Val Arg His Ala Asp Gln Leu Gln Ala Ala Ala Asp 225 230 235 240 | Lys Asp Val Leu Glu Arg Ala Gln Thr Gly Ser Val Ala Leu Gly Glu 245 250 255 | Phe His His Gly Gly Cys Arg His Phe Gly Ile Asp Ala Val Asp Gly 260 265 270 | Val Thr Asp Gly Ala Gln Ala Phe Gly Cys Glu Gly Phe Ala Ala Asp 275 280 285 | Val Cys Phe Gly Asp Glu Gln Gln Val Asp Asp Phe Gly Glu Phe Ala 290 295 300 | Val Phe Ala Leu Phe Gly Gly Asn Glu Glu Glu Val Ala Leu Arg Val 305 310 315 320 | Ala Leu Pro Val Phe Arg Gly Val Asp Val Asn Gly Leu Ser Val Asp | | | |

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Val | Phe | Ala | Asp | Val | Val | Gln | Gln | Glu | Gly | Cys | Gly | Val | Phe | Val | Phe | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Arg | Leu | Tyr | Glu | Asp | Lys | Glu | Ser | Gly | Asp | Asp | Phe | Ala | Asp | Lys | Asp | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Phe | Leu | Gln | Gly | Ala | Gly | Ile | Gly | Gln | Gly | Val | Phe | Leu | Gln | Glu | Ala | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Ala | Asp | Val | Phe | Gly | Gln | Ser | Val | Val | Ala | Gly | Asp | Gly | Gly | Lys | Ala | | |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 | | |
| Gly | Ile | Gly | Leu | Gln | Ala | Val | Glu | Gln | Gly | Leu | Val | Phe | Val | Gln | Leu | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | |
| His | Ala | Cys | Phe | Phe | Phe | Phe | Gly | Gly | Gly | Ala | Asp | Lys | Leu | Val | Val | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| Asn | Phe | Gly | Ile | Lys | His | Ile | Val | Arg | Ala | Phe | Lys | Asn | Arg | Glu | Gly | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Ala | Asp | Val | Asp | Ser | Asp | Ile | Ala | Gly | Gly | Val | Ser | Ala | Phe | Lys | Thr | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Leu | Arg | Ala | Gln | Glu | Phe | Leu | Gln | His | Leu | Arg | Gly | Gly | Val | Ser | Val | | |
| | 145 | | | | 150 | | | | | 155 | | | | | 160 | | |
| Phe | Arg | Gly | Glu | Gly | Phe | Asp | Asp | Val | Arg | Leu | His | Gln | Leu | Met | Gly | | |
| | | | 165 | | | | | 170 | | | | | | 175 | | | |
| Asp | Gly | Cys | Asn | Gly | Arg | Asn | Gly | Met | Ala | Asp | Val | Ala | Val | Lys | Asn | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| Leu | Gly | Asn | Leu | Met | Ala | Ala | Pro | Asp | Phe | Ala | Ala | Phe | Val | Ile | Asp | | |
| | | 195 | | | | | 200 | | | | | | 205 | | | | |
| Glu | Ser | Asp | Val | Val | Ala | Asp | Val | Ser | Phe | Gln | Val | Phe | Lys | Gly | Val | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Phe | His | Asn | Ala | Val | Arg | His | Ala | Asp | Gln | Leu | Gln | Ala | Ala | Ala | Asp | | |
| | 225 | | | | 230 | | | | | 235 | | | | | 240 | | |
| Lys | Asp | Val | Leu | Glu | Arg | Ala | Gln | Thr | Gly | Ser | Val | Ala | Leu | Gly | Glu | | |
| | | | 245 | | | | | | 250 | | | | | 255 | | | |
| Phe | His | His | Gly | Gly | Cys | Arg | His | Phe | Gly | Ile | Asp | Ala | Val | Asp | Gly | | |
| | | | 260 | | | | | 265 | | | | | 270 | | | | |
| Val | Thr | Asp | Gly | Ala | Gln | Ala | Phe | Gly | Cys | Glu | Gly | Phe | Ala | Ala | Asp | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | |
| Val | Cys | Phe | Gly | Asp | Glu | Gln | Gln | Val | Asp | Asp | Phe | Gly | Glu | Phe | Ala | | |
| | 290 | | | | | 295 | | | | | 300 | | | | | | |
| Val | Phe | Ala | Leu | Phe | Gly | Gly | Asn | Glu | Glu | Glu | Val | Ala | Leu | Arg | Val | | |
| | 305 | | | | 310 | | | | | 315 | | | | | 320 | | |

Ala Leu Pro Val Phe Arg Gly Val Asp Val Asn Gly Leu Ser Val Gly
325 330 335

Ile Phe Val Val Arg Leu His Phe Ser Gly Asn Arg Arg Ala Gly Gly
340 345 350

Phe Gly Phe Gly Asn Ala Thr Ala Ala Leu Ala Phe Glu Asn His Val
355 360 365

Gln Thr Leu Cys Asp Leu Arg Phe Ile Ala Glu Leu Leu Gln Trp Leu
370 375 380

Gln His Gln Arg Ala Phe Asp Ala Gly Thr Gln Arg Asn Gly His Ala
385 390 395 400

Val Met Pro Arg Asn Pro
405

<210> 2063
<211> 411
<212> DNA
<213> Neisseria gonorrhoeae

<400> 2063
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gcaacaagct gcatgagttc gtctgccgcc tgcattgctt ttggggggat gacctgcgcg 360
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<210> 2064
<211> 136
<212> PRT
<213> Neisseria gonorrhoeae

<400> 2064
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Arg Trp Met Leu Ala Trp Ser Gly Glu Val Ser Ala Ser Pro Ser Ala
35 40 45

Ala Leu Ala Thr Arg Val Ser Lys Arg Ala Arg Arg Leu Pro Ser Ala
50 55 60

Ala Thr Val Cys Cys Gly Asp Glu Glu Met Leu Cys Ser Ala Thr Val
65 70 75 80

Ser Gly Val Pro Met Thr Ala Glu Met Val Ser Ser Ala Cys Arg Arg

85

90

95

Arg Leu Phe Arg Ala Thr Ser Cys Met Ser Ser Ser Ala Ala Cys Met
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Ser Phe Gly Gly Met Thr Cys Ala Ser Val Ala Val Trp Val Ser Asp
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Gly Met Ala Val Cys Phe Ser Val
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<210> 2065

<211> 411

<212> DNA

<213> *Neisseria meningitidis*

<400> 2065

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 tcaggcgtgc cgatgacggc ggagatgggt tcttcagcct gtcggcgag gttgtttcgg 300
 gcaacaagct gcatgagttc gtctgccgcc tgcattgtcgt tttgggggat gatctgcgcg 360
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<210> 2066

<211> 135

<212> PRT

<213> *Neisseria meningitidis*

<400> 2066

Met Val Leu Pro Leu Met Leu Leu Ala Thr Ile Arg Ser Ala Thr Leu
 1 5 10 15

Thr Leu Arg Leu Ala Met Leu Asn Arg Val Ser Pro Ser Thr Thr Arg
 20 25 30

Trp Met Leu Ala Trp Ser Gly Glu Ile Ser Ala Ser Pro Ser Ala Ala
 35 40 45

Leu Ala Thr Arg Val Ser Lys Arg Thr Arg Arg Leu Pro Ser Ala Ala
 50 55 60

Ala Val Cys Cys Gly Asp Ala Glu Ile Leu Cys Ser Ala Thr Val Ser
 65 70 75 80

Gly Val Pro Met Thr Ala Glu Met Val Ser Ser Ala Cys Arg Arg Arg
 85 90 95

Leu Phe Arg Ala Thr Ser Cys Met Ser Ser Ser Ala Ala Cys Met Ser
 100 105 110

Phe Trp Gly Met Ile Cys Ala Ser Val Ala Val Trp Val Ser Asp Gly
 115 120 125

Met Ala Val Cys Phe Ser Val
130 135

<210> 2067
<211> 411
<212> DNA
<213> Neisseria meningitidis

<400> 2067
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ttgccgtcgg cggcaacggt atgttgcgga gatgaggaaa tggtgtgttc ggcaactgtg 240
tcaggcgtgc cgatgacggc agagatgggt tcttcagcct gtcggcgcag gttgtttcgg 300
gcaacaagct gcatgagttc gtctgccgcc tgcattgtcgt tttgggggac gatctgcgcg 360
agtgttgcgg tttgggtttc agacggcatg gcggtctgtt tttcggtttg a 411

<210> 2068
<211> 135
<212> PRT
<213> Neisseria meningitidis

<400> 2068
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1 5 10 15
Thr Leu Arg Leu Ala Met Leu Asn Arg Val Ser Pro Ser Thr Thr Arg
20 25 30
Trp Met Leu Ala Trp Ser Gly Glu Ile Ser Ala Ser Pro Ser Ala Ala
35 40 45
Leu Ala Thr Arg Val Ser Lys Arg Thr Arg Arg Leu Pro Ser Ala Ala
50 55 60
Thr Val Cys Cys Gly Asp Glu Glu Met Leu Cys Ser Ala Thr Val Ser
65 70 75 80
Gly Val Pro Met Thr Ala Glu Met Val Ser Ser Ala Cys Arg Arg Arg
85 90 95
Leu Phe Arg Ala Thr Ser Cys Met Ser Ser Ser Ala Ala Cys Met Ser
100 105 110
Phe Trp Gly Thr Ile Cys Ala Ser Val Ala Val Trp Val Ser Asp Gly
115 120 125
Met Ala Val Cys Phe Ser Val
130 135

<210> 2069
<211> 1554
<212> DNA
<213> Neisseria meningitidis

<400> 2069

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<210> 2070

<211> 517

<212> PRT

<213> *Neisseria meningitidis*

<400> 2070

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                20                      25                      30
```

```
Pro Ile Asn Gly Asn Arg Gln Arg Lys Pro Met Ile His Thr Glu Pro
                35                      40                      45
```

```
Ser Ala Gln Pro Ser Thr Met Asp Thr Ala Ala Phe Leu Lys His Ile
                50                      55                      60
```

```
Glu Ser Ala Phe Pro Arg Ile Phe Ser Asp Gly Ile Asp Leu Met Arg
                65                      70                      75                      80
```

```
Tyr Leu Pro Glu Asp Lys Trp Leu Ala Leu Lys Gln Ala Gly Leu Leu
                85                      90                      95
```

```
Leu Pro Phe Leu Asp Lys Lys His Gly Gly Arg Lys Gly Ser Gln Phe
                100                      105                      110
```


| | | | |
|---|-----|-----|-----|
| Glu Ile Gln Glu Val Leu Arg Ile Ala Gly His Tyr Gly Val Pro Val | 115 | 120 | 125 |
| Thr Leu Arg Thr Gly Ile Glu Gly Ala Leu Val Leu Gln Pro Leu Gln | 130 | 135 | 140 |
| Glu Phe Gly Gly Glu Ala Gln Val Ala Gln Gly Leu Asp Met Ile Phe | 145 | 150 | 155 |
| Lys Gly Glu Ser Arg Arg Leu Gly Val Thr Glu Pro Glu Thr Ser Gly | 165 | 170 | 175 |
| Ala Ala Ile Ala Arg Glu Met Gln Ser Cys Tyr Glu Tyr Thr Asp Glu | 180 | 185 | 190 |
| Gln Thr Ile Tyr Val Asn Ala Ala Lys Tyr Trp Gln Gly Asn Ser Gln | 195 | 200 | 205 |
| Ser Asp Phe Leu Leu Val Ala Ala Lys Glu Arg Lys Asn Gly Lys Leu | 210 | 215 | 220 |
| Ala Lys Val Ile Asp Leu Leu Leu Val Pro Lys Thr Tyr Ile Arg Cys | 225 | 230 | 235 |
| Glu Thr Leu Ala Ser Glu Gly Leu Arg Ala Val Arg Tyr Ala Val Asn | 245 | 250 | 255 |
| Arg Ile Asp Ala Glu Met Pro Ala Thr Ala Val Met Lys Leu Ser Arg | 260 | 265 | 270 |
| Gly Asp Ala Ala Gly Leu Arg Ala Phe Gln Asn Ile Phe Ile Arg Ser | 275 | 280 | 285 |
| Arg Leu Gln Leu Ile Gly Met Thr His Gly Ile Met Glu Tyr Ile Leu | 290 | 295 | 300 |
| Asp Asn Leu Asn Arg Tyr Val Arg Asn Asp Ile Arg Phe Val Asp Tyr | 305 | 310 | 315 |
| Glu Arg Arg Glu Ile Gln Arg Arg His Gln Val Ser Glu Ile Leu Tyr | 325 | 330 | 335 |
| Arg Tyr Val Cys His Ser Val Ser Pro Val Ala Pro Val Ala His Gln | 340 | 345 | 350 |
| Leu Met Glu Ala Asn Ile Val Lys Thr Leu Ala Thr Glu Tyr Thr Tyr | 355 | 360 | 365 |
| Ala Ala Ala Gln Met Leu Gln Lys Leu Leu Gly Ala Lys Gly Phe Glu | 370 | 375 | 380 |
| Arg Gly His Pro Ala Gly Asn Ile Ala Ile Asp Ile Arg Pro Phe Thr | 385 | 390 | 395 |
| Ile Phe Glu Gly Pro Asn Asp Met Leu Tyr Ala Glu Ile Tyr Asp Gln | 405 | 410 | 415 |

Phe Val Arg Ala Thr Ala Glu Glu Lys Glu Ala Gly Ile Lys Leu Asp
 420 425 430

Lys Asn Gln Thr Leu Leu Asp Ala Val Gln Thr Asp Val Arg Phe Ala
 435 440 445

Ala Val Ala Arg Asp Tyr Ala Leu Pro Glu Asp Ile Arg Ser Phe Leu
 450 455 460

Gln Glu His Thr Leu Thr Asp Ala Cys Ala Leu Gln Lys Val Phe Ile
 465 470 475 480

Gly Lys Ile Ile Ala Arg Leu Phe Val Phe Val Gln Glu Glu His Glu
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Asp Thr Thr Ala Phe Leu Leu Asn Asp Ile Arg Lys Asp Ile Leu Asp
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Cys Arg Tyr Cys Gly
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<210> 2071

<211> 1554

<212> DNA

<213> Neisseria meningitidis

<400> 2071

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